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ABSTRACT

This volume is the result of a policy seminar on Improvement and Innovation in Higher Education in Developing Countries, organized by the Economic Development Institute and the Population and Human Resources Department of the World Bank in collaboration with the Institute of Strategic and International Studies of Malaysia. The seminar was held in June 1991 in Kuala Lumpur. Twenty-two participants attended from Eastern Europe, Africa, Asia, the Middle East, Latin America, and the Caribbean. The first paper provides a report on the seminar, with discussion of five quality issues: access to higher education, financing of higher education, the relationship between government and higher education institutions, the role of higher education in developing science and technology, and the role of evaluation. Recommendations are listed, and appendixes to the paper list participants, the program, seminar papers, and session papers. The volume also includes the texts of the three session papers, including: "Keynote Address: Higher Education and Economic Development" (I. G. Patel); "Improvement and Innovation in Higher Education" (Adriaan M. Verspoor); and "The University System: Engine of Development in the New World Economy" (Manuel Castells). (References accompany two of the papers.) (JDD)

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Economic Development Institute
of The World Bank

Improving Higher Education in Developing Countries

Angela Ransom
Siew-Mun Khoo
Viswanathan Selvaratnam

Contributors
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I. G. Patel
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EDI SEMINAR SERIES

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EDI Seminar Series

Improving Higher Education in Developing Countries

Angela Ransom
Siew-Mun Khoo
Viswanathan Selvaratnam

Contributors
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I. G. Patel
Adriaan M. Verspoor

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FOREWORD

This volume is the result of a policy seminar on Improvement and Innovation in Higher Education in Developing Countries organized by the Economic Development Institute and the Population and Human Resources Department of the World Bank in collaboration with the Institute of Strategic and International Studies of Malaysia. The seminar was held in June of 1991 in Kuala Lumpur. Twenty-two participants attended from Eastern Europe, Africa, Asia, the Middle East, Latin America, and the Caribbean.

The purpose of the seminar was to solicit comments on important issues raised in a number of papers prepared for presentation at, or as background readings for the seminar; to obtain information on countries' experiences in resolving problems in the higher education sector; to widen the analysis and understanding of possible policy options for the World Bank's research and lending programs for higher education development; and to help the World Bank develop higher education policies better through sharing ideas and experiences across a wide range of countries.

Amnon Golan
Director
Economic Development Institute

ABBREVIATIONS

HE	higher education
HEI	higher education institution
OECD	Organisation for Economic Co-operation and Development
R&D	research and development

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REPORT ON THE SEMINAR

Angela Ransom, Siew-Mun Khoo,Viswanathan Selvaratnam

Introduction

Higher education (HE) has an important mission to generate new knowledge and prepare graduates for positions of leadership and responsibility in a rapidly changing and increasingly complex and competitive world. During the past three decades, higher education institutions in developing countries have witnessed a multifold increase in enrollments. Resources, both public and private, have not kept pace with escalating enrollments and costs. In many countries rising demand and enrollments, undifferentiated access policies, exclusive public funding, underutilization of professional staff, overly theoretical curricula, and inappropriate teaching methods have led to high unit costs, high dropout and repetition rates, low completion rates of graduates, and the production of graduates whose skills and specializations do not reflect those needed in the labor market. As a result, most higher education institutions in the developing countries are finding it difficult to generate and apply the knowledge needed to meet the rapidly changing requirements of scientific and technological innovation. Notwithstanding the general crisis in the quality and efficiency of HE in the developing countries, the conditions of HE vary significantly across geographical regions, both between countries in a single region and among institutions in the same country. This implies a rich variety of possible policy responses for improvement and innovation.

Given the serious challenges that confront higher education in many developing countries, planners, policymakers, and higher education leaders will need to justify expenditure on higher education in terms of its relative costs and benefits to society. To do so they will have to understand the critical issues and problems so that they can develop effective policy responses to achieve greater efficiency in the use of resources and to improve the social relevance of HE results. To provide credible and effective policy advice, policy reforms, and program assistance in this sector, the World Bank must sharpen its understanding and analysis of the technical, financial, and political issues the developing economies face in order to formulate a balanced strategy for future action. An essential element of success in this area is for the World Bank to involve the key actors in higher education in developing countries in its policy analysis and formulation process. This worldwide consultation meeting was intended as part of that process.

The seminar on Improvement and Innovation in Higher Education in Developing Countries was organized by the Economic Development Institute and the Education and Employment Division, Population and Human Resources Department of the World Bank, in collaboration with the Institute of Strategic and International Studies, Malaysia. Twenty-two participants attended from Eastern Europe and developing countries in Africa, Asia, the Middle East, Latin America, and the Caribbean plus ten participants from Malaysia, nine resource persons, seven staff from the Institute of Strategic and International Studies, nine staff from the World Bank, and six observers from international and regional donor agencies (see appendix 1 for details).

The purposes of the seminar were as follows:

- To solicit comments on crucial issues raised in a series of papers analyzing important issues in higher education;
- To obtain information on countries' experiences in resolving problems in the HE sector;
- To widen the analysis and understanding of possible policy options for the World Bank's research and lending programs to sustain higher education development;
- To help the World Bank develop higher education policies better through sharing ideas and experiences across a wide range of countries.

This open and frank exchange of views led to a better understanding of the problems confronting HE and should result in the formulation of appropriate policies. In addition, the World Bank's policy paper should be more credible, more acceptable, and more beneficial to the countries concerned.

This report summarizes the seminar's proceedings and presents recommendations for further analysis and research in subsequent regional meetings.

Overview

Higher education may mean different things to different people. However, the central point about HE is that unlike other forms of capital, it transcends mere economic returns. HE returns are the very substance of development and progress, and are difficult to quantify and compare with economic returns (Patel).[1] A society that is educated and informed is better able to make fundamental decisions for itself. Education prepares people to make such decisions more objectively and provides the environment for social and cultural innovation.

In addition to satisfying inner aspirations and personal thirst for knowledge, the direct benefits of HE are very real. It enhances the quality of life, including individual dignity, self-respect, and command over one's own life, which are the true hallmarks of individual freedom (Patel). Even though HE will not necessarily reduce inequalities of income, if effectively provided it serves to narrow differentials in skills and knowledge, thereby opening up new horizons and opportunities to the recipients and giving them more choices.

HE also aims to provide a country with a pool of trained and skilled manpower to meet the labor market's ever-changing needs. Such a labor force has better absorptive capacity for technological changes and innovation, while informed entrepreneurs can make better use of resources. Both are essential to greater productivity and economic growth. It is only the technologically skilled who can exploit national resources efficiently. In the modern environment, scientific progress and innovation can effectively overcome many of the obstacles to development. Investment in human resources in the form of education, particularly higher education, is part and parcel of a civilized existence, an end in itself, even as it is a means to other ends. Therefore, it is arguably the best form of investment for the future (Patel).

The above assumptions are only viable if universities are effective. While teaching and research remain their primary concerns, their social and professional services to society are growing in significance. Great universities nurture mankind's highest ideals and defend them against all odds. Their effectiveness as social and economic catalysts is measured by their ability to achieve excellence.

In most developing countries the state has assumed the principal role in financing HE. Financing, whether public or private, has an impact on HE access, choice, and quality. However, where financing is public, the state can directly influence admissions policies, governance, institutional autonomy and accountability, and consequently the quality of teaching and research. This has given rise to various issues and problems. Countries have used free higher education and undifferentiated access policies to satisfy the goals of national development and to respond to the growing demand for HE. At the same time, competing claims for scarce resources make accommodating everyone impossible without standards deteriorating.

1. All sources cited are drawn from papers presented at the seminar. For details see appendix 2.

Limited resources stemming from rising national debt and breakdowns in national economies have resulted in a decline in the quality of teaching and research; lack of maintenance of existing infrastructures; and inadequate libraries, equipment, and physical facilities. Thus, the financing of HE is a crucial issue. Countries must consider all available mechanisms and strategies for effective use of existing resources and for mobilizing additional resources for HE, including private sources.

Open access policies to HE in many countries have been aimed at achieving the dual goals of obtaining qualified manpower and social equity. The responsiveness of higher education institutions (HEIs) to skills needed in the labor market has suffered as a result. To cope with excess demand and to ensure that graduates' skills are relevant to the labor market's needs, access policies should reflect the diversity in students' backgrounds and abilities. They should encourage institutions to adjust their objectives and programs to respond to this diversity, and to allocate students among fields of study and institutions according to ability and type of HE desired: traditional academic, vocational, short-cycle, distance learning, full-time or part-time, and so on. Encouraging a range of institutions with different objectives and clients will help relieve some of the pressures of excess demand and social equity objectives. Selection policies to promote institutional diversity will also help manage the tradeoffs between quality and quantity, efficiency and access for the disadvantaged, and social harmony.

In the face of such problems and shortages, the evaluation of teaching and research and accountability for funds become important. Education investments tend to be large, and many developing countries cannot sustain them. Therefore funds must be well managed and institutions efficiently run. Similarly, the effectiveness of faculty teaching and research output should be evaluated. At the same time, evaluation and accountability should be accompanied by increased autonomy to encourage institutions to be innovative and flexible in their pursuit of quality and excellence. However, many of the current policy problems in higher education have their roots in historical precedents, social traditions and values, and political imperatives. The authorities must address the underlying policies that affect funding, admissions, personnel, and regulatory decisions if the quality, efficiency, and effectiveness of HE are to be enhanced.

The participants discussed quality issues under five main themes: (a) access to higher education, (b) financing of higher education, (c) the relationship between government and higher education institutions, (d) the role of higher education in developing science and technology, and (e) the role of evaluation (see appendix 3 for the seminar program).

Access

In situations of excess demand for education, HEIs use access policies to select the most qualified candidates, to reduce overcrowding through rationing places according to specific criteria, and to give underrepresented or disadvantaged groups an equal opportunity.

The choice of access policies has implications for quality and efficiency. Inappropriate selection policies produce repetition, dropouts, and waste. To promote quality and the best use of resources, admissions policies must be fair and be based on candidates' merits and ability to benefit from higher education. Access policies must also encourage institutions to respond to the demand for different types of HE by different social and ability groups, and to recognize and react to labor market signals.

Financing

Financing policies determine how efficiently HEIs mobilize and use the available resources, the quality and effectiveness of their teaching and research programs, and their ability to increase training and research in productive sectors. The current situation in most developing countries of free or below cost higher education irrespective of private or societal returns produces inefficiencies and inequity. As competition for resources and demand for places increase, governments will not be able to subsidize all programs at a level that ensures their

quality and effectiveness. Available resources will have to be invested where they produce the most cost-effective results in terms of teaching and research. In addition, HEIs will have to come up with strategies for reducing their exclusive reliance on public financing of higher education.

Relationship between Government and Higher Education Institutions

The objective of government involvement in higher education is to assure quality, maintain accountability for how HEIs spend public funds, and ensure the training of manpower to meet the country's economic development needs. The degree of government involvement in finance, admissions, and regulatory policies affects HEIs' quality, efficiency, and innovativeness. Considering the crucial role of the state in most HE systems in developing countries, government regulation must promote institutional autonomy, flexibility, and innovation to support improved quality.

The Role of Higher Education in Developing Science and Technology

Changes in international economic structures due to new development processes based on technology make it imperative for developing countries to build up their knowledge base in scientific and technological fields. The development and expansion of scientific and technological research capacity is essential for countries to participate in the increasingly market driven, interdependent global economy. With limited research funds, countries need viable national science and technology research policies to help set priorities, determine their comparative advantage, choose between different fields and disciplines, and foster links between university research and development (R&D) and that done by the private and public productive sectors in order to derive the full economic and social benefits of technological innovation.

The Role of Evaluation

Evaluation of HEIs is important for gauging and improving their overall performance, in particular, their achievements in instruction, research, and student learning. Evaluation is also important for accountability. Universities should be held accountable for their efforts and outcomes in terms of the costs and benefits of university programs. National governments and international funding bodies need to know how well universities use their physical and financial resources and how well they serve the labor market and economic development. Ongoing evaluation directed at the information needs of decisionmakers and administrators will improve the efficiency and effectiveness of universities.

Conclusion

The above themes cannot be considered in isolation. Each interacts with the others to influence quality. Furthermore, HE is but one of many sectors within a national economy, and therefore subject to influences and pressures from other national states. Thus, accreditation problems may have their roots in political dictates, and graduate unemployment may derive from factors other than the quality of the graduates themselves. Poor teaching may not be a result of poorly trained lecturers, but may be a consequence of their having to hold down multiple jobs out of economic necessity. This often results in a loss of skilled and trained manpower due to emigration. The developing countries will also have to address these problems if the quality of HE is to improve.

Discussions

This section is divided according to the five main themes covered in the seminar: (i) access, (ii) financing, (iii) relationship between government and higher education institutions, (iv) the role of higher education in developing science and technology, and (v) the role of evaluation. Discussions consisted of indepth analysis of the major issues surrounding each of the five main themes, exchange of country experiences in addressing issues, and analysis of the implications of past experiences and lessons for future improvement policies.

Access to Higher Education

Developing countries' inability to satisfy the ever-increasing demand for higher education, the high costs of its provision, and the growing importance of the quality of graduates' knowledge and skills in determining future international economic competitiveness underlie the need for universities to have fair and efficient selection policies. The social and economic costs of poor selection are high. Governments typically finance 90 percent of the costs of a student's HE, but failure rates are high, ranging from 30 to 70 percent (Klitgaard). The social and economic benefits of a trained cadre are great: increased stability, productivity, competitiveness, and entrepreneurship. Selection criteria for an efficient, fair, and open system should satisfy the tenets of quality and equity by selecting the most able students without favoring those from a particular socioeconomic background, geographic area, or ethnic or linguistic group, and of efficiency by maximizing the quality of educational results per unit of cost, both in terms of the level of achievement and the desired mix of skills.

During the 1960s national economies were expanding rapidly. Countries made massive investments in education in response to the increasing demand for skilled manpower. Expansion and equality of access, particularly at the higher education level, were the watch-words in both the industrial and developing countries. The goals were to produce more, better educated men and women, and to break down traditional barriers to educational opportunity. As secondary schools opened up, many more students finished upper secondary school and reached the university entrance level. Until the early 1970s most countries had free access to anyone who could pass the national selection examination. Zimbabwe went from 500,000 students in university at independence to 3 million today; Brazil had a HE enrollment of 100,000 in the 1960s and today has about 100 million; in 1979 China had 1 million students enrolled in HEI but by 1988 that number had more than doubled; and in 1985 only 14,000 students were enrolled in university in Cameroon, but by 1991 that number had almost tripled. Western Europe achieved HE expansion by merging technical and teacher training colleges with traditional universities.

Contrary to expectations, the expanded access to education did not automatically ensure that countries turned out qualified manpower in the areas needed for sustained growth and development, nor did they achieve equality of access. In addition, standards of teaching, learning, and research suffered. Moreover, graduates' skills did not correspond to those required by the labor market for a number of reasons: the rapid expansion of enrollments while resources were stagnating or contracting; the politicization of staff and students; the wide variation in applicants' ability and preparation; and the poor quality of selection devices, which emphasized memorization rather than reasoning and problem solving, and effectively narrowed the material taught at lower levels of education. By the late 1970s many countries with previously open higher education systems were experimenting with different selection criteria to cope with rising demand, escalating costs, and declining standards.

A case study from the Philippines illustrates the inherent tensions between equity and quality in access policies. Before the 1970s, the University of the Philippines had a relatively open access policy based on secondary school grades. Concern about the diversity in the quality of preparation of students, the high failure rates (over 30 percent of students admitted did not pass their university course work), and the university's inability to admit all qualified secondary graduates under the open admissions policy as their numbers increased resulted in the

introduction of a standardized College Admissions Test as an additional selection criterion. The test was designed to increase the university's ability to predict which applicants would successfully complete their university studies. Of those taking the test, the university admitted only the top 25 percent. The result was an overrepresentation of higher-income students from the Manila area. To offset a possible test bias and eliminate the underrepresentation of low-income groups, in 1977-78 the university started an experimental selection policy to increase the number of students from economically disadvantaged backgrounds. Low-income students were admitted with lower test scores than the general requirement for admission and provided with academic counseling and remedial courses. The underlying assumption was that the admissions test underpredicted low-income students' ability to learn. However, despite remedial courses disadvantaged students not only had much lower graduation rates, but their general academic performance was much lower than their admission scores indicated. Thus, the university decided that the admissions test was not biased against low-income groups and abandoned the preferential admissions policy.

Discussion

This case study raises a number of access policy issues, such as the objectives of selection; the costs and benefits of socioeconomic group representation; bias in academic and other measures; and the tradeoffs between quality, efficiency, and equity inherent in selection policies.

CONFLICTING OBJECTIVES. Admissions policies often have conflicting objectives and consequences. Social priorities and political pressures frequently influence selection objectives and policies, especially in situations where demand exceeds the number of places available. Universities must select the best minds for the future labor force, while at the same time making the best use of their resources and promoting social equity. Managing the tradeoffs among different policies is difficult and requires careful analysis of the social and economic objectives of selection and how they influence the quality of the intake of students, the quality of educational outcomes of HE graduates, and the graduates' relative success in the labor market. Malaysian HEIs face tension between access on merit and quotas to satisfy political pressure for social equity. National policies to secure university places for minorities resulted in the development of a second pre-university track running parallel to the normal route of access to university. The two-track system essentially means that universities have two ability groups. Preparatory and maintenance programs for the parallel track put more pressure on teaching staff and resources. However, national commitment to these policies is intended to maintain national growth, political stability, and equality of opportunity.

EXCESS DEMAND. The participants identified the following ways to handle the excess demand many countries face: (a) increase the number, variety, foci, goals, and admissions criteria of higher education institutions, for example, by using distance education, open universities, polytechnics, and shorter-cycle institutions linked more closely to employment; (b) introduce special entrance or aptitude tests for fields of study in high demand; (c) raise admission requirements, thereby reducing the number and increasing the quality of students; and (d) charge fees and have some form of scholarship and/or loan scheme available for poorer students.

STRUCTURAL DIVERSIFICATION. In Western Europe many countries with traditionally open access university systems have experimented with differentiated admissions policies to stimulate institutional diversity and greater labor market orientation. Institutions were given more autonomy in setting and applying admissions criteria and in awarding degrees and diplomas. The goal has been to encourage competition between institutions to stimulate the development of higher quality programs and to attract students and funding. Such an approach forces HEIs to define their objectives, market niche, and clients in light of their comparative advantage. It

also encourages institutions to pay attention to labor market signals and demand in setting selection criteria for entrants and performance criteria for graduates.

In the United Kingdom structural diversification of HE has resulted in differentiation along the following lines: (a) high quality research universities that compete for public and private research grants according to past performance and the merit of current proposals; (b) high quality teaching institutions that offer strong academic training and scholarship; (c) short-cycle vocationally and market-oriented institutions that provide high quality teaching and research linked to the labor market; and (d) distance learning institutions that offer access to adults and geographically and educationally disadvantaged students (the Open University). Similar structural reforms to stimulate differentiation have occurred in France, Germany, Norway, and Sweden. Structural diversity has made it possible to expand access to HE, to respond to the demand for different types of HE by different social groups and consumers of HE, and to provide HE that recognizes and reacts to labor market signals.

Many developing countries have established vocationally-oriented institutions (China, Indonesia, Mexico), regional universities (Thailand), and private institutions (Brazil, Indonesia, Philippines) to deal with excess demand and to stimulate closer links with the labor market. China has had tremendous access problems: in 1979 China had over 7 million secondary school graduates, but the universities could accommodate only 670,000 students. To cope with this level of demand, China established 500 new universities in a five-year period and channeled 50 percent of secondary school graduates into vocational institutions designed to train mid-level technicians. To respond to demand pressures, Hungary, with only about 4 percent of the age cohort enrolled in universities, plans to increase fees to supplement government funds and introduce loans to offset costs to poor students. In Brazil the pressure of demand for HE is absorbed by private universities: 65 percent of higher education students are enrolled in private institutions. Enrollment in the elite public universities has been frozen at about 35 percent for the past ten years. The public non-fee-paying medical schools have 100 applicants per place. Such non-fee-paying schools cater to the better off, high performing students and lead to high profile careers. Paradoxically, poorer students pay for a private education of much lower quality that leads to low-income careers. By contrast, in Mexico excess demand is absorbed by a broad base of tertiary institutions of varying quality. There are twelve to fourteen universities at international standards, about twenty-five mass public institutions, plus polytechnics, technical colleges, and teachers' colleges. At the high end of the scale, private institutions predominate. These charge high fees, cater to about 13 percent of total demand, and have graduation rates of 89 percent, with 90 percent of graduates finding immediate employment. At the other end of the spectrum, 60 percent of graduates of open access public universities are unemployed, and the teaching staffs' low salaries and multiple jobs result in low research output. Thailand offers a model from which countries can draw useful lessons. It has responded to rising demand by establishing a large base of tertiary institutions throughout the country. An open university system siphons off excess demand, while a few superior flagship institutions maintain quality for national development. As each region in the country has its own institutions, preferential selection devices to ensure equitable representation is not a central issue.

SELECTION DEVICES. In many developing countries admissions tests may not be valid in predicting applicants' ability to benefit from higher education. Often a lack of staff qualified in assessment techniques and practices hampers the development of reliable measures of achievement and learning ability. In some countries primary and secondary schools lack the basic instructional resources to develop students to their full potential.

In Cameroon only 3 percent of students starting out in primary school reach university. Selection for HE is based on public examinations at the end of secondary school and access is open to all who pass the examination. Academic performance is usually poor. In the humanities and arts repetition is rampant, graduation rates low, and employment prospects dismal. However, enrollments in these fields continue to expand. The selection instrument in Cameroon does not correlate with educational or labor market outcomes. Rather, it is a convenient tool

given limited resources and places, and the need to give all taxpayers' children a fair chance to enter publicly-funded institutions. Similarly, in Uganda the demand for university education continues to expand despite no assurance of employment and the lack of relevance of the studies offered. Young people have a better chance of finding employment if they attend a commercial or technical school, but such schools are students' third choice.

China uses its university selection examination to guarantee the quality of education and to make the best use of its resources. In the 1970s Chinese authorities replaced national examinations based on academic criteria with family background and political criteria. This policy crippled China's universities and slowed its economic growth for a decade. China reinstated the rigorous national academic examinations in the 1980s as part of its modernization effort. The current policy is to achieve a certain level of development through high quality education, and to address equity problems gradually. Some consideration on socioeconomic grounds is given to the autonomous region, which is combined with one extra year of study for graduation. In addition, regional quotas based on the best students from each province are used for flagship institutions like Beijing University.

In Malaysia a small HE sector has been equated with quality. HE spaces were restricted and selection policies were supposed to select the top performers to ensure that all students graduated. However, the concept of social equity took precedence over quality in the public sector, where national selection policies based on quotas superimposed on merit criteria were applied to redress perceived social injustice. In the private institutions selection is based on merit. As manpower needs continue to exceed what can be produced locally, the best students are sent overseas.

Zimbabwe tries to meet excess demand by expansion. However, universities are currently admitting only one out of four applicants (2,500 out of a pool of 10,000 per year). Applicants are admitted based on their grades. There are no selection policies to achieve equity and no evaluation of the adverse impacts of selection criteria. Policymakers believe there is no need for special allowances to ensure regional or gender representation (30 percent of applicants admitted in 1991 were female) as the applicant pool is homogenous, mostly from rural backgrounds.

BACKWASH EFFECT OF SELECTION POLICIES. Selection policies also influence what is taught at the lower levels of education. The rejection of large numbers of students due to limited places causes secondary schools to focus almost exclusively on teaching to the selection test rather than teaching the broad range of educational objectives prescribed in the curriculum. Unselected students often have no recourse to either further education or employment, which results in wastage of resources and human potential. In Hungary, where only 12 percent of the age cohort is enrolled in higher education, of which only one-third are enrolled in universities, the authorities have introduced a new policy that bases admission to university on secondary school work rather than on a one-shot test at the end of the cycle. The objective is to make what is taught in high school relevant for those who go on to university as well as for those who go on to other forms of training or employment.

REMEDIAL PROGRAMS. Unless disadvantaged students are provided with effective remedial programs, those receiving preferential admission will not benefit from higher education, resulting in the wastage of scarce resources. Moreover, preferential policies can undermine the credibility of the academic qualifications of disadvantaged groups and result in further discrimination. For example, in Uganda preference is give to females in HE. However, women already in the labor market feel that such policies lower their status in the labor market and cause employers to question their abilities.

LACK OF DATA. The quality of data and of analytical techniques needed to make rational choices on access policies relative to costs and benefits are often inadequate, and their implications for quality and efficiency poorly interpreted.

CONCERNS. Unequal access to HE often reflects deficiencies at lower levels of the education system. Preferential policies and remedial action at the university level may not be the most effective means of redressing inequalities arising from disparities in school quality because of geographical location; socioeconomic class; or ethnic, group, or gender differences.

Policy Implications

If HE is to advance a population's knowledge and ability to innovate with the aim of achieving economic and social development, countries will have to address quality issues before further expansion occurs. If high quality applicants and successful academic performance are the priority objectives of selection policies, then care should be taken that selection instruments are valid predictors of ability to learn. Tests must measure reasoning and problem-solving skills rather than rote memorization. Preferential selection is politically acceptable if the effect on total places awarded is marginal and no real displacement of qualified candidates occurs. However, preferential selection must be accompanied by sustained instructional and remedial courses to help disadvantaged students reach the same level as other students. The authorities should take the duration and method of remedial instruction into account when evaluating the success of preferential selection policies. However, in the final analysis, equity is a political and philosophical issue. Each country will have to determine the appropriate balance between social equality goals and economic growth goals based on its particular situation.

International aid agencies can play a leading role in assisting countries in their efforts to improve selection policies by supporting country-level research on (a) assessing the meaning of examination results, (b) developing better performance-based measures of the outcomes of university training, and (c) developing analytical tools for understanding the consequences and managing the tradeoffs of alternative selection policies. Technical assistance could be used to upgrade the capacity of relevant personnel in admissions and testing techniques and practices. Given the diversity in country-conditions, donors should promote flexible, country-specific policies that use the universities as catalysts for change. They should avoid blanket policies based on general analysis of issues and problems.

Financing Higher Education

In many developing countries the central government funds national universities. In some countries, however, a system of private universities funded by different organizations (religious, professional) runs parallel to the public HEIs. So long as resources permit, problems may not arise, but most developing countries face grave constraints resulting from excess enrollment and scarce resources. In the face of growing excess demand, expecting the state to be able to continue increasing subsidies to the HE sector would be unrealistic. Such subsidies generally have their origins in social traditions, values, historical precedents, and political dictates rather than in efficiency and equity considerations. Under these circumstances, countries are exploring different strategies to reduce or to shift the costs of maintaining HEIs from central funds to other sources of finance to ease the public burden. The objective is not only to mobilize new sources of funds to improve teaching and research, but to use existing resources more efficiently. The central issue is to define who should pay, how much, for what kinds of HE, and when such payments should be made. The seminar examined two types of financing mechanisms: (a) cost recovery through rationalizing subsidies to HE according to relative private and societal benefits, and (b) privatization of HE.

Cost Recovery

One way to recover costs is to introduce tuition fees in line with the benefits received from HE. The premise is that returns to HE comprise both private and societal benefits, therefore costs should also be borne proportionately by the individual and the state. Bigger subsidies should be given to those fields that produce greater societal benefits, while programs that

produce essentially private benefits should be paid for by students (Tan). This would be more equitable and would reduce the state's financial burden. Uncertainties in estimating in advance the magnitude of private benefits accruing from HE to an individual raises the issue of the optimum time to charge for these benefits. Some argue that charging for these benefits based on the actual rather than presumed benefits of education through differentiated tax and salary structures is more equitable and efficient, as one cannot effectively determine beforehand the size of private benefits.

Further research is necessary to determine how private and societal benefits vary in different fields of study and at different levels of higher education in specific country and institutional contexts. Further analysis of the tradeoffs between subsidizing education inputs through differential fee structures and grant schemes and charging for the outcomes of education through differential salary and tax structures is also needed.

Privatization

Another financing mechanism is to promote private funding and provision of HE. The crucial issue here is to determine how much and what kind of privatization. An awareness of the evidence in favor of privatization as well as an understanding of the problems associated with privatization are needed to formulate sound policies about how much and what kind of private HE is desirable. Problems relate to the creation, financing, and performance of private HEIs (Levy). The rationale for creating private HE stems from the perceived failure of public institutions. Evidence of failure ranges from inadequate and declining resources, inefficient use of existing resources, poor quality of instruction, and low market value of degrees awarded, to public institutions' inability to meet the demand for increased access to higher education. Proponents of privatization promise that quality and efficiency can be achieved through greater and the right incentives: political and professional freedom, flexibility, and diversity.

Despite the arguments in favor of privatization, problems occur in creating, financing, and assessing the performance of private HEIs.

CREATION. Many of the problems associated with establishing private HEIs have historical roots. The prevailing postindependence development ideology stressed the state's overriding role. In many countries this resulted in legal sanctions against private higher education and the rise of state higher education systems that perpetuated and protected their political and professional power and interests against the encroachment of private institutions. In Malaysia private HEIs are prohibited by law, but they exist anyway, just as they do in Brazil and China. In other countries, such as the Philippines and Indonesia, private HEIs have flourished and now exceed public ones. However, their quality leaves much to be desired.

FINANCE. Many countries' private sectors are still not sufficiently developed to support private funding of HE. Furthermore, government policy does not provide incentives for the development of private philanthropy, and in many instances places outright restrictions on private contributions to HE. Consequently, most private universities in developing countries generate the bulk of their income from tuition fees. Some governments even regulate the level of these. Government assistance to private institutions tends to be rare and minimal. When such assistance does exist, it often breeds discontent and fear of competition for scarce resources among existing state institutions on the one hand, and fear of loss of autonomy among private universities on the other. Foreign assistance to HEIs in developing countries has tended to be highly targeted to certain priority fields and does not always favor private institutions.

PERFORMANCE. The performance of private HEIs can be measured in terms of efficiency, quality, and equity. Assessments vary depending on whether the reference level is the institution, the sector, or the system (Levy). As institutions, private HEIs attract students and resources and award degrees that lead to employment of students in the fields they chose to offer. However, private HEIs tend to concentrate on fields that are less expensive to offer and

neglect socially important areas. Their public counterparts are left to cover more, higher-cost fields of study, usually with students with more diverse academic backgrounds and abilities. Where state HE is the mass system, the quality tends to be superior in elite private institutions. In cases where private HE is the mass system, as in Brazil or the Philippines, state institutions receive the better educated candidates from elite, often private, secondary schools. The less well-off have to pay for an education of inferior quality in low status private institutions.

Efficiency measured in terms of utilization rates and student-staff ratios also vary. Low student-staff ratios may be good in terms of quality, but inefficient in terms of unit costs. Private institutions may also benefit from the facilities and faculties of public institutions, thereby reducing their overall unit costs and gaining efficiencies at the expense of the public system. As such, the performance of private institutions cannot be evaluated separately from public institutions, which they often complement or supplement. The performance of HE has to be measured taking into account the roles of both private and public institutions in the education system as a whole.

Discussion

Participants recognized that in situations of excess demand for HE, governments will have to explore alternative sources of funding and provision. Discussions focused on the relationship between private and societal benefits of HE and the difficulty of assigning distinct values to each, as well as the equity implications of introducing user charges.

THE PREMISE. Most would agree that HE has both private and societal benefits. However, educators are less certain about the ability to estimate the size of direct personal benefits as distinct from societal benefits of "consuming" HE. Formulating policies based on these distinctions becomes problematic as no direct correlation exits between the volume of HE consumed and later wealth. Individuals' future earnings and benefits would be in doubt until they are able to succeed both in their scholastic endeavors and their careers. In assigning benefits, opportunity costs and risks in relation to the magnitude of rewards must be carefully considered for each individual.

UNCERTAINTIES. Difficulties also arise in establishing how much a person's private benefits are worth and the level of societal benefits generated. This is because even when entrepreneurs can use their educational input to create wealth for themselves, they are simultaneously creating wealth and employment for others (externalities) that must be taken into consideration. Just as people can gain from society's subsidies to them in providing them with HE, so does society benefit from their continuing to serve society as trained, skilled individuals. Even so, tax differentials to mitigate the private returns to higher education are already in place in many developing countries such as Zimbabwe. However, they need further rationalization and refinement.

INABILITY TO PAY. Real difficulties are encountered in situations where qualified students are unable to pay. This has implications both for developing manpower potential and equity issues. Assistance in the form of scholarships, bursaries, and grants can offset potential inequities provided they are sufficient for all who are in need and qualified to receive them. Some countries have tried loan schemes, but they have not worked in countries such as Brazil and Uganda, where administrative costs and default rates have been high. In other countries, Malaysia and Colombia, for example, scholarships combined with government service have worked well. Complete elimination of subsidies for private benefits may perpetuate inequities by excluding disadvantaged groups from certain fields of study.

PRIVATIZATION. Most participants felt that education is a public good, and that some state involvement is necessary. In addition, investing in human resources makes good economic sense

as the state will reap dividends in many other ways: economic development, political maturity, and socialization processes (absorbing values, good work ethics, pluralism, patriotism, and so on). However, state involvement should not preclude the existence of private funding and provision. In situations of high demand and low resources governments need to be flexible in mobilizing alternative sources of funding and provision. At the other extreme, private HE should not be completely market driven and profit-oriented and compromise academic standards to commercial interests. Countries must decide on the right mix between public and private sector financing of HE based on their particular social and economic circumstances.

Policy Implications

The participants thought that it is important to explore fee recovery schemes. The state should attempt to extract as much as is feasible. However, this is only part of many other strategies to expedite efficiency, for example, rigorous accounting, and reduction of waste and costs. Shifts in budgetary allocations, for example, from defense to education, could also be considered. Innovative joint ventures between the private and public and national and international university sectors might be another possibility. Different types of taxation, direct and indirect, might be levied, with the proceeds going to education. Reform of HE subsidies should be based on careful study and analysis. As situations differ from country to country, in-depth, country-specific studies must be undertaken to determine possible financing strategies. In the final analysis the total benefits to higher education (both private and public) may always exceed total costs. Once again, an individual country's context and priorities will determine the final balance between the two.

State-Institution Relationships

In many developing countries, government policies to provide free higher education, undifferentiated access, and job guarantees to HE graduates have led to high unit costs and dropout rates, low and longer completion rates of graduates, and imbalances between the number and types of graduates produced and the number and types of jobs available. In crisis situations governments and HEIs need to re-examine and renegotiate their relationship to improve quality and efficiency. The public administration literature describes two principal strategies of government regulation that are reflected in government/HEI relationships worldwide, and that affect the HEIs' ability to respond to changing social and economic realities, namely, the rational planning and control strategy and the self-regulation strategy (van Vught).

Government Regulation Strategies

The rational planning and control strategy has its roots in the ideal of rational decisionmaking, where all alternatives and consequences are considered. It implies centralization of the decisionmaking process and a large amount of control over both the choice of a given policy and its implementation. This strategy of government regulation is reflected in the state control model of HE systems. The state control model is traditionally found in continental Europe, where HEIs were created and almost exclusively financed by the state. The French HE system, for example, is characterized by centralized bureaucratic control exercised by the Ministry of Education. The Ministry of Education regulates access policies, curricula, degree requirements, the examination system, the appointment and remuneration of academic staff, and so on. The objective of detailed state regulation is to standardize degrees, which are often awarded by the state rather than the university. In the continental model, state control is combined with the strong authority of senior chaired professors, who hold considerable power at the lower level of the system. Thus, the HE power structure reflects the interests of two groups: state officials and senior professors. The HE power structure is characterized by a strong state at the top, weak institutional administration in the middle, and strong senior

chairholders at the bottom. The state controls the appointment of chairholders and uses the HE system for its professional manpower needs in the government bureaucracy and the labor market, and for establishing legitimacy through detailed control (van Vught).

The self-regulation strategy recognizes that knowledge of the object of regulation is highly uncertain, emphasizes monitoring the feedback of critical variables, and assumes that fragmentation of complex decisonmaking processes offers the benefits of greater flexibility and innovativeness, and lower information, transaction, and administration costs. It emphasizes and respects the self-regulatory capacities and complex interrelations between decentralized decisionmaking units. External regulation is confined to monitoring and evaluating the performance of the overall system or the self-regulating decisionmaking units, and when appropriate changing the rules that define good performance. The self-regulation strategy corresponds to the state supervising model of higher education. It has its origins in the traditional British and in the U.S. higher education systems. Traditional British universities are chartered corporations combining the influence of faculty guilds with that of trustees and administrators (vice-chancellors) They are responsible for their own management and decide on admissions, curricula, and the hiring of faculty. Although the government funded HE (until the policy changes of the Thatcher government), budgetary allocation remained in the hands of senior professors in the University Grants Committee. In the United States HEIs are also established as chartered corporations, but the influence of institutional trustees (regents) and administrators (presidents) is stronger than in the United Kingdom. Trustees generally appoint the president, who has authority over strategic and financial policies. In the United States professors do not have the power of chairholders in continental universities, but the authority of the faculty is nevertheless substantial, especially in the academically stronger institutions. The government has hardly any power at the federal level. State-level regulation is confined to mechanisms for organizing quality assessment, regulating the right to award degrees, and assuring academic quality and accountability (van Vught).

Western European models of academic structure and governance were exported to developing countries during the colonial period. In British colonies the state supervising model was initially introduced. The power of national government was limited and the autonomy of the HEIs regarding enrollments, student selection, and staff appointments was respected. The imposition of the continental model of HE, especially the French model in parts of Africa and Asia, meant the introduction of the state control model, with a powerful national government, a centralized administrative system, civil service employment, and a standardization of diplomas and degrees. The HE models from Spain and Portugal that were introduced in Latin America implied the transfer of ties to both church and state. Because the crown wielded more power, a model of strong state control prevailed (van Vught).

Whichever model prevailed in a country during the colonial period, colonial authorities were very much concerned about the loyalty of the universities and their students and graduates, and made considerable efforts to ensure their loyalty and weed out dissident elements. Despite these controls colonial universities were sources of cultural, political, and intellectual ferment. University intellectuals were the key nationalist leaders of independence movements (Altbach 1989). After independence, nationalist leaders were concerned with establishing legitimacy and achieving national integration. Many newly independent governments used HEIs as instruments of national integration and development. State authorities decreed massive increases in student intakes and guaranteed employment to graduates at relatively high salaries without having adequate resources. The by-product of the drive for national integration and development was elite, high-cost institutions and increased centralization and control. The state control model eventually supplanted the British state supervising model introduced during the colonial period (van Vught).

Given the situation of crisis in HE in developing countries, the central question is which of these two models is best suited to stimulate the changes needed to improve the quality and efficiency of HEIs? The research evidence indicates that the state supervising model is more compatible with the fundamental characteristics of HEIs and the conditions necessary for successful innovation in HE systems. Western HE systems are characterized by the professional

autonomy and authority of academic experts engaged in generating, conserving, transmitting, disseminating, and applying knowledge. In both the continental and British models, authority over teaching and research is traditionally located at the lower levels of the institution with the academic professionals. Fields of knowledge are the basic unit of attention in HE, and knowledge activities take place in autonomous cells loosely linked together into a system. Organizational fragmentation makes it possible to add and subtract fields of knowledge without disturbing others. This produces diversity among institutions and explains the adaptability of HEIs. Organizational fragmentation also explains why decisionmaking power is spread over a large number of units and actors. These characteristics suggest that complete control of HEIs from an external position is difficult without limiting organizational variety and severely restraining professional authority. Such external control would undermine the institutions' ability to perform their legitimate knowledge-related tasks.

The innovation literature indicates that the greater the formalization, centralization, stratification, and emphasis on efficiency (concern with costs or cost reduction) in an organization, the lower the rate of organizational change or innovation. Because HEIs are decentralized, informal, complex organizations whose professional ethos places a high premium on the quality of outputs, they favor the conditions necessary for innovation. However, these very characteristics make the spread of innovation between autonomous units and among institutions in the system more difficult. In nonhierarchical systems change cannot be decreed from above, but must be negotiated and sanctioned based on the perceived self-interests of those who will implement the innovation.

To succeed, reform policies should pay attention to the basic characteristics of HEIs. Historically, academic structures and regulations have evolved to protect the interests of teachers and researchers. Innovations that are at odds with these structures and accepted practice will be resisted. Government strategies to bring about innovations in HEIs succeed when they respect the basic values and mechanisms of academic life. When government-led innovations imply a radical departure from these, change should be limited to a few functional areas, while at the same time, other prevailing values and practices are safeguarded. External innovations are also more likely to succeed when the relative advantage of the innovation compared to current practice is clear to those who are suppose to accept it.

The state control model, which favors centralization and a large amount of control, is less successful at stimulating innovation in HE because its underlying assumptions are at odds with some of the fundamental characteristics of HEIs, such as the large degree of professional autonomy, the organizational fragmentation, and the diffusion of decisionmaking power. The model prevents a multiplicity of approaches and increases the likelihood of the arbitrary dictate and the large error. It also overlooks the costs of acquiring knowledge for the sake of creating innovations and fails to recognize that in a complex, multilevel system, general knowledge is usually more economically acquired by higher-level decisionmaking units, while specific knowledge is more easily and cheaply acquired by lower-level units. Rigid and detailed oversight procedures and hierarchical control often lead to unnecessary and unproductive bureaucratic systems removed from the knowledge advantages of lower-level decisionmaking units. Such systems can stifle innovative potential at this level. Furthermore, if power is in one place and better knowledge in another, the unit with knowledge can use it to evade, counteract, or redirect orders from superiors in the hierarchy. Decisions suffer as a result (van Vught).

The state supervising model is better suited to the context and fundamental characteristics of HEIs and can use these characteristics to stimulate change and innovation in the system. By limiting itself to global forms of steering and putting confidence in the self-regulatory capacities of the academic professionals and the basic units of HEIs, this model could be effective in achieving the objectives of HE in developing countries. It has the advantage of devolving the responsibility for deciding overall system objectives down to the level of the individual knowledge units. It also offers good conditions for an increase in the internal and external efficiency of HE systems in developing countries. The state supervising model addresses HEIs in terms of autonomy and accountability. It permits a large amount of autonomy

for HEIs to determine their own goals and programs and the means to pursue these without government intrusion. In turn, it implies a supervising role for government to monitor the general rules within which HE systems operate and hold HEIs accountable to society for their efforts and results. Such an approach should stimulate individual HEIs to adjust their programs in response to local circumstances and changes in the labor market.

Discussion

The two models of HE regulation were useful as a general framework for analysis. However, many participants felt that actual country situations cut across the two models presented. Existing HE systems in developing countries reflect the adaptation of transplanted Western academic models to changing political and economic circumstances. Some countries, in the interests of national integration and social representation, have established mass systems of uneven quality that strain available staff and facilities. Others have created high-cost, elitist systems with little diversity and differentiation between institutions or responsiveness to the labor market. Both have frequently resulted in distortions in the basic values and mechanisms of academic life in many HEIs. Particularly in instances where state control is extreme, it has tended to sap the initiative of HEIs and effectively prevented them from making any positive changes. In such instances, change occurs only when systems stall or collapse completely. However, where state control predominates, there are instances of innovative initiatives inspired by faculty educated abroad in more autonomous, market-responsive HE systems, or by international aid agencies like the World Bank (Kenya, Yemen, Malaysia). Moreover, economies like the Republic of Korea, Singapore, and Taiwan (China), where government steering has been strong, have produced high quality HEIs that have responded successfully to market needs.

ROLE OF GOVERNMENT REGULATION. Most participants recognized the advantages of the state supervising model in creating a context for change. The essential issue is how to move from government regulation that is a barrier to university development and limits HEIs' ability to innovate, to a form of regulation that promotes quality and efficiency. In other words, how does one strike a balance between government intervention and university autonomy. On the one hand, professionals in HEIs should have the autonomy to determine what to teach and what to do research on and how. On the other hand, autonomy without accountability for efforts and outcomes may make HEIs isolate themselves from the productive sectors and society's needs. For example, in Hungary, where student/staff ratios are low due to the small percentage of the relevant age group enrolled in HE, universities have refused to raise student/staff ratios in order to educate more students for the same costs for fear of compromising traditional standards of quality. In such instances external intervention may be necessary to steer universities toward greater efficiency.

Some form of regulation is necessary because government funding is crucial, and national development and responsiveness to society are important goals of HE in developing countries. Problems occur when the function of regulation is to restrict rather than to stimulate institutional flexibility and choice, when it is an agent of the *status quo* rather than an agent of positive change. Traditionally, governments assumed control over enrollments and admissions to create an indigenous civil service, but in the future governments will no longer be the major employer of HE graduates. An important goal of HE in the coming decades is training and research to promote and strengthen private development initiatives. The relationship between government and HEIs in terms of governance and finance will need to reflect these new goals.

The participants agreed that government regulation has tended to restrict HEIs' flexibility and innovative behavior. However, they acknowledged that government regulation can successfully support quality and efficiency by giving HEIs the autonomy to decide how to spend funds and what to teach accompanied by accountability for their level of performance and output.

In this context, a state/HEI partnership in which the state does not interfere in areas of content and effectiveness of teaching and research as long as the university remains efficient and responsive to society's needs seems appropriate. This implies that the government will allow HEIs to determine the goals, content, and standards of teaching and research, but will hold them accountable for using the most cost-effective means of achieving these.

FORMULA FUNDING. The participants noted that the use of market mechanisms to encourage HEIs to produce graduates efficiently without sacrificing quality seemed worthy of further study in different country contexts. This implies that governments can redesign the HE funding system to influence HEIs' responsiveness to public needs and economic demand without much interference with institutional autonomy to allocate available funds freely.

Policy Implications

Individual countries need to go beyond general frameworks and undertake in-depth studies to determine the actual mechanisms of state/HEI relationships and how these have evolved over time. Such analysis should adopt a multilevel approach to examine the system as a whole, the various institutions within the system, and the basic units. Based on the findings of these studies, countries should experiment with different strategies of government/HE governance and financing.

HE governance should also encourage differentiation. Diverse structures accommodate the conflicting tasks of HE better than simple ones, and by allowing status differentiation and sectoral diversification they also stimulate flexibility and innovation. The state supervising model offers the advantages of flexibility and innovation, of experimenting, and of self-determination and responsibility. In addition, its administrative costs are relatively low.

The Role of Higher Education in Science and Technology

In the past two decades technology has revolutionized economic products and processes. Linked to this is the growing importance of global markets to national economic development. Countries unable to cope with these advances will become increasingly marginalized, and their economies will either stagnate or decline. The intellectual skills of the labor force, especially in science and technology, has become the major determinant of economic productivity, innovation, and competitiveness.

Higher education has a pivotal role to play in training the labor force and generating the knowledge and research necessary to create and use technology to meet society's needs. Higher education as it is currently organized and financed in developing countries is finding it increasingly difficult to assume this role. While access to technology is critical to development, the capacity to create and use science and technology is still a scarce resource and is extremely unevenly distributed throughout the world. Most developing countries are among the technologically poor, and face many problems in trying to improve their indigenous technological capabilities (Castells).

Historical Context

Many of the problems associated with HEIs in developing countries have their origins in the historical functions of universities and how these evolved over time. Historically, universities have essentially performed four functions: (a) forming and diffusing ideas and values, (b) selecting and socializing elites, (c) training the labor force, and (d) generating research (Castells). These functions are not mutually exclusive and co-exist in most universities, with their relative dominance shifting with economic, political, and social circumstances. The function of universities in developing countries has been to select elites, first for colonial administration, and after independence for the national civil service. The need for a technical work force led to increasing emphasis on labor training. With the accelerated pace of scientific

and technological research in recent years and its key role in determining economic prospects, universities in developing countries are attempting to increase their level of training in the scientific and technical fields.

Constraints

The general policy framework, institutional infrastructure, and incentive mechanisms of the higher education system have hampered efforts to make universities become the focus of technology transfer and indigenous technology development. Universities have been unable to manage the different, often conflicting, functions of disseminating ideas, preparing society's leaders, training the labor force, and generating new knowledge.

Higher education policies deeply rooted in concerns for preserving cultural identity and forging national unity have created a climate that does not encourage the independent and innovative thinking necessary for academic research. This has contributed to the brain drain of the best technically trained nationals of developing countries to the industrial countries, where the environment and conditions for advanced research are more favorable. This in turn adds to the scarcity of academic staff in the new technological fields in developing countries. Bangladesh, India, and Pakistan, for example, have highly qualified professionals worldwide, but they do not benefit their own countries because of the lack of the necessary infrastructure and incentives. By contrast, Korea has adopted science and technology policies designed to create incentives to bring expertise back to the country. Institutions are built and outfitted with the most advanced equipment to receive returning technical personnel. As a result, from a country with no microtechnology industry in 1972, Korea became a leader in the microtechnology industry with the creation of the first 270K microchip in 1989 (Castells).

Another barrier to the development of indigenous science and technological capacity is inadequate teaching and training facilities. The lack of journals, reference materials, and laboratory facilities favor the lecture method of teaching, which is inappropriate for effective training in experimental science and the professional fields. Consequently, enrollment increases are still mainly in the traditional fields of the humanities and social sciences, which are less expensive and easier to teach using existing facilities.

Finally, the link between research and the productive sectors is weak or nonexistent in many developing countries. The labor market is unable to absorb the existing engineers and science graduates while, paradoxically, there are not enough skills in the general labor force to stimulate the creation of firms in the technology fields to generate more jobs in these areas. The development of the aeronautical engineering field in Brazil is an example of a successful link between research and industry. A strong engineering education in a high-quality HEI with strong links to international institutions such as the Massachusetts Institute of Technology produced the caliber of manpower to build up an aircraft industry.

Improvement Strategies

These constraints point to the need for developing countries to adopt a concerted strategy to enhance the role of HEIs in generating and disseminating scientific and technological knowledge. Such a strategy must encourage collaboration and coordination between researchers in universities; public and private sector agencies; and organizations at the national, regional, and international levels. International aid must be directed toward developing the policy and institutional setting and training high-quality staff.

The development of human minds is primary and is a pre-condition for the development of the material infrastructure of technological change (Castells). Ensuring the quality of intake of students becomes all the more important. Alternative selection and recruitment policies will determine the quality of graduates produced; the level of knowledge and skills they attain; and their adaptability, creativity, and entrepreneurial skills. Such issues are an important dimension of the policy and institutional setting of HE, and will influence the pace and success of change and development.

Discussion

The participants acknowledged the key role of universities in economic development and the need to enhance their capacity to carry out high-level postgraduate training and to create and disseminate advanced knowledge and research. At the same time, they recognized the importance of upgrading the general public's level of scientific knowledge by improving basic science teaching in the education system as a whole.

China is an example of a country that reoriented its HE system to promote basic and applied research in science and technology. After the Cultural Revolution, China realized that the old political and ideological functions of the universities had not brought about modernization. Between 1980 and 1985 China begin to rethink the role of higher education. A new emphasis on higher education and science and technology as the key to development emerged. The government launched a concerted effort to enhance the capacity of universities to carry out research linked to China's economic development needs. The leading national universities began to develop two types of staff: teaching faculty that spent 70 percent of their time teaching and 30 percent carrying out research, and research faculty who spent 70 percent of their time on research and 30 percent on teaching. University cooperation with industry and the National Academy of Sciences increased. The Chinese also realized that technology transfer meant more than acquiring technical hardware. It also meant developing the ideas, knowledge, and expertise to adapt and produce one's own technology. Thus, China sent students abroad to acquire knowledge and expertise. At first, training focused on basic science, and later on applied science and technology. To ensure that students returned to China after their training the government stipulated that the last year of study and the awarding of the degree had to take place in China.

The participants expressed concern about trying to live up to the U.S. model of research. At the higher education level in many developing countries, problems of inadequate resources and infrastructure and too few qualified personnel frequently cause competition for scarce resources between research and training. In such an environment the concept of centers of excellence or networks of universities become important as ways to pool resources among institutions to nurture both research and teaching. Examples of such centers are the International Institute of Insect Physiology and Ecology, the International Rice Research Institute, and the Coffee Research Institute. However, there are political and cultural barriers to regional collaboration and integration. Moreover, regional centers have not always lived up to expectations. They are frequently based on individual personalities rather than institutional capacity, the catchment area is usually too small for sustained progress, and they are difficult to maintain once donor funding or expatriate leadership ceases.

Lack of an entrepreneurial tradition, lack of an indigenous scientific culture, and weak or inappropriate government involvement in technology development add to the barriers against sustained research and development capacity in many countries. For example, during the 1960s and 1970s Makerere University in Uganda had developed a high level of research in agriculture and tropical medicine. A university teaching hospital and agriculture extension service linked research to national development. However, with prolonged political upheaval and the resulting failure of the economy, the university lost staff and became marginalized. In Malaysia research institutions and decisions on technology policy fall outside the university sector, while university research is more academically oriented. University staff have been involved in development planning and are just starting to become active in research related to economic development. Similarly, research institutions in Zimbabwe are outside the university sector. Universities produce the manpower to run such institutions. However, efforts are just beginning to develop a coordinated technology policy and strategy. In Mexico university involvement in planning economic development has been minimal and the universities are not preparing manpower with technological skills. This is being done at a lower level, usually by foreign-owned companies. Recently, new research institutes have been established to bridge the gap between universities and industry.

External factors, such as international terms of trade and patent and copyright laws, also restrict access to technologies. When new knowledge does not enter the public domain where it can be widely absorbed, resource-poor developing countries are at a disadvantage.

Policy Implications

Countries need to formulate national science and technology development policies. Such policies would not only guide the choice between different fields of research according to need and/or comparative advantage, but would also help establish where basic and applied research could most effectively be carried out (at universities or other private or public institutions) and where to link up with international and regional networks. Sound planning and sustainable funding schemes should accompany the formulation of national policies and the identification of research needs and niches. In Indonesia, a joint United Nations Development Programme/United Nations Educational, Scientific, and Cultural Organization funded project is developing an information system to help decisionmakers and universities determine where to focus their research efforts.

Aid agencies should concentrate support and channel resources to selected centers or networks of excellence in large countries or regions, emphasizing the role of science and technology for national and regional economic needs. The United Nations University is already undertaking initiatives in this area by supporting the establishment of regional centers in important fields. An international center for software development is being set up in Macao for developing countries. Regional research centers exist for natural resources in Ghana and for mineral resources in Zambia that serve Africa, and for biotechnology in Venezuela that serves Latin America.

Twinning arrangements with institutions in developed countries is a model for the least developed countries. Uganda has such an arrangement with a U.S. university. Research is targeted to needs for development in specific areas and for a specified time frame.

Ultimately, each country will have to decide what is most feasible and sustainable given its particular economic and institutional context. More research on best practices with centers of excellence, regional networks, and twinning arrangements can inform such decisions. Where appropriate, donors can play the role of catalyst in fostering regional collaboration and integration by ensuring that successful practice is documented and widely disseminated.

The Role of Evaluation

The rapid expansion of higher education and its restructuring to meet the diversity in students' academic backgrounds and needs have increased concerns about maintaining quality standards and justifying resource use. This has led to the growing prominence of evaluating what universities do to guide future funding, development, and innovation policies. Evaluation is particularly important in the developing countries because of the rapid expansion and diversification of formerly elite systems, the need to do more with the same or fewer resources, and funding agencies' increased desire to know how well their investments are being used.

The evaluation of higher education in developing countries has been characterized by conflicting rationales and expectations, confusion over terminology and methodology, and mistrust about the purposes of evaluation results. In the absence of an evaluation tradition and capacity, universities in developing countries need some principles and guidelines for establishing appropriate evaluation policies.

Terminology

Many terms have been used to denote the process of assessing the outcomes of institutions in relation to goals and the resources employed to achieve them, for example, accountability, evaluation, auditing, inspection, monitoring, and peer review. Evaluation of HEIs' academic quality to assess the caliber of instruction, research, and student achievement—usually done by

academic peers—and evaluation for accountability to assess HEIs' teaching and research programs in terms of costs and benefits—usually carried out by funding agencies—are common in HE. For evaluations to be effective they must not focus solely on results, outputs, outcomes, or impacts. They must consider inputs, the reason why certain outcomes occur, and how to improve future performance. Confusion over terminology prevails in environments (a) of uncertainty about how funds are spent and the quality of results achieved, (b) of mistrust about the purposes of evaluation, and (c) where those who commission the evaluation have more power over how its results are used than those conducting the evaluation or being evaluated. Evaluation should not be punitive or tied to changes in resource allocation. It should be an exercise that allows actors in institutions to learn from their mistakes and weaknesses to improve their future performance.

Methods

Most evaluations employ a mixture of information gathering methods. Currently countries of the Organisation for Economic Co-operation and Development (OECD) use four main methods, although they tend to overlap and distinctions are not always clear cut (Winkler). They include (a) direct measurement, for example, student achievement tests and observations of performance; (b) quantitative indicators linked to inputs, processes, and outcomes; (c) statements by those directly involved in the institution evaluated, namely, students, faculty, and administrators; and (d) statements of external experts or peers.

Direct measurement yields the most indisputable results, but it is time consuming and costly to develop and use the instruments. However, because the information that direct measurement provides is more acceptable when it is linked to specific activities (curricula or research, for example), it is also difficult to compare different activities.

Many educators favor indicators because the information they yield is supposedly based on objective and measurable data that can be presented in a short, aggregated form. The use of indicators employing similar statistical scales to measure different types of processes and outputs increases the comparability of the information gathered. Indicators are hampered by the inaccessibility of data and the tendency to select indicators based on the ease of access to data rather than the indicator's explanatory power in relation to the problem being analyzed. Indicators are most useful if they are closely related to the underlying quality or efficiency criteria being measured. However, they should not be used as the sole source of evaluation information. Their explanatory power is increased if used in conjunction with other methods.

Actors' statements allow a broad range of information to be gathered with less effort and fewer costs and ensures against bias through representative samples. The use of open-ended questions leaves room for unanticipated responses that could result in the refining of success criteria. Some people have criticized one type of instrument in this method, graduate surveys, for exaggerating the links between the education received and professional success in the workplace.

Statements by external experts is the most common evaluation method used in higher education worldwide. External experts are viewed as impartial, distinguished peers, which gives their findings weight. They can observe and analyze a broad spectrum of issues with more latitude and depth, in less time, and at lower cost than standardized procedures allow. However, they are often too subjective and base their judgments on their theoretical or ideological views rather than on rigorous analysis of the data.

Conventional approaches to evaluation may not allow for the university's need to be creative and to provide diverse programs of study in the pursuit of constantly evolving knowledge. Unlike business and industry, HE goals often cannot be clearly stated and consistently pursued. New evaluation approaches take into account the evolving nature of higher education in response to internal and external circumstances, and consequently the need to constantly redefine and revise the goals of HE. Such approaches emphasize the impact of personal interaction, mutual understanding, and actor participation in shaping and refining goals (Winkler).

Evaluation Principles for Developing Countries

In developing countries evaluation is often triggered by external funding. Externally sanctioned and imposed evaluation often leads to mistrust and political pressure to undermine the objectivity of evaluation results. Added to this is the lack of readily available information and the high cost of gathering information in relation to the operating expenses of the units to be evaluated. The absence of an evaluation tradition, combined with unfavorable conditions for extending and improving evaluation, point to the need for guiding principles to help developing countries formulate appropriate evaluation policies along the lines of the following (Winkler):

- Evaluation methods cannot be transferred unaltered from the OECD to developing countries. Evaluation policies and methods must take into account the economies' specific information needs and constraints. Four case studies (Chile, Nigeria, Taiwan (China), and Thailand) illustrate the type of analysis needed. This includes the historical development of HEIs; their mission; structures; sources of finance; the level of training and remuneration of faculty; and methods of controlling the quantity and quality of student intake and how these have evolved in response to changing political, economic, and social circumstances. In each of the cases, the tendency has been to move from traditional, elite HEIs with restricted access to expanded and/or more diversified institutions (regional, distance, and private institutions) of uneven quality. Expansion policies always sought to balance wider access with maintaining standards of quality. Ideally, evaluation nets should be cast widely to take into account such systemic factors that determine success or failure that may be far removed from the institution or program under evaluation. The need to limit costs should not preclude efforts to broaden the scope as much as feasible.
- Prior experiences and local attitudes about evaluation will determine the evaluation's content and method. Fear, mistrust, and resistance stemming from HEIs' prior experience with donors and their relationship with the government will have an impact on the utility of evaluation results. Local attitudes about the reliability and authority of information, who receives the evaluation information at various levels of authority, and incentives for ensuring the accuracy of data and using it to solve problems and improve the system will also affect the results' utility. To increase mutual trust and support for the evaluation process, and consequently the accuracy, reliability, and utility of the information collected, developing countries should develop a code of ethics about the methods of information collection and analysis and the use made of evaluation results.
- The cost of evaluation in many developing countries may be too high, especially when using difficult measurement instruments. Usually the shortcomings of institutions and programs are easily detectable using low-cost, less complicated, comprehensive expert review approaches. However, political pressures can undermine the authority of even acknowledged experts. This indicates a need for information from other sources to improve the reliability of results. The difficulty of gathering comparative data on key indicators of different programs and units may make statements from actors a more viable complementary evaluation approach in developing countries, especially as successful surveys of actors foster a high degree of cooperation between the various HE actors needed for evaluation to lead to improvement.
- The developing countries need to enlarge their evaluation capacity by training experts in evaluation and developing appropriate evaluation instruments.

Discussion

The participants were primarily concerned with evaluation of "what," "by whom," and "for what purpose." Currently evaluations are top-down using elite U.S. schools as the model. Participants called into question the integrity and purpose of evaluations that do not take the university's mission, goals, and aspirations into account. Internally defined evaluation goals will determine the ease with which an evaluation culture based on mutual trust, acceptance, and consultative cooperation will develop. It will also determine the degree to which evaluation outcomes will be used to overcome weaknesses and improve performance. Indonesia and Chile link evaluation to positive incentives, such as a promise of additional funds for good performance or overcoming particular weaknesses and shortcomings.

Linking evaluation to goals and aspirations also helps to identify the appropriate evaluation approach, method, or instrument, for example, long-term, short-term, or continuous, internal or external approach, direct or indirect method. Ultimately approaches complement each other. A mix of approaches, though more costly in time and resources, increases the explanatory power and reliability of a single method and the utility of evaluation outcomes. Approaches and methods also evolve over time in response to HEIs' changing mission, structure, and funding sources.

Discussions focused on evaluation of how well funds are spent and evaluation of the quality of teaching and research. Evaluation of how well HE serves the labor market and economic development was noted as important, particularly by China and Yemen, but was not discussed in detail. Separating the different aspects of evaluation was not always possible as objectives and instruments quite often overlap. Countries practice a range of approaches. In Mexico HEIs practice self-evaluation and the results are not made public. In Zimbabwe the university and the government carry out comprehensive joint reviews, but there is no continuous follow-up. China has established an academic commission to carry out peer group performance reviews of institutions and programs that cover internal and external efficiency and the quality of academic work.

Evaluation for Accountability

In countries such as China, where the HE sector is very large and expanding and external funding is used for assisting development, evaluation is crucial. Policymakers need to know whether government or donor funds are being used wisely. The results of evaluation can ensure better use of financial and physical resources and better matching of outcomes to national needs. Indonesia, with 44 national universities and 900 private institutions in a country spread over thousands of islands, is also concerned with accountability for how funds are spent. In Cameroon evaluation revealed that a student takes an average of eighteen years to finish a three-year program, that a four-year program to train medical interns costs US$300,000, and that some faculties have 130 staff for fifty students. Cameroon recognizes the utility of such information for planning and decisionmaking and is adopting ongoing institutional and program evaluation using common methodologies that permit comparisons among institutions and programs. At the other extreme, Uganda, where more than 80 percent of the university budget is devoted to student housing and board while libraries go lacking, has created a "culture of inefficiency" that militates against evaluation.

Evaluation and Academic Quality

Evaluation of academic quality can determine whether a university has achieved its academic goals and reached the standards it has set for instruction, research, and student achievement. The participants agreed that evaluation of academic performance should be carried out by academics or peer review groups.

Once again they focused on the tradeoffs between excellence and equal access. Both principles are important and cannot always be accommodated. Elitist admission policies ensure

quality output, which assures future national development. Equal access satisfies equity concerns and meets political and social imperatives such as harmony, unity, and stability, which also have implications for economic development. A compromise solution may be to require fairly good performance standards for admission overall, but more rigorous selection and screening for a few flagship institutions.

The quality of teaching and research staff is a major determinant of the quality of graduates and the research carried out and their eventual impact on the labor market and economic development. Quality can be encouraged by such measures as on-going, formal evaluation processes that could be linked to promotions and allocation of research grants. Built-in incentives of this sort must be consistently and fairly applied.

The problem of degree accreditation is very real in many developing countries. Nonrecognition of degrees prevents graduates from further studies at other centers of learning and obstructs promotions and research efforts. While upgrading of quality is fundamental to this problem, the political aspects of the problem must also be recognized. Proper and objective evaluations are necessary to establish standards achieved and to ensure universal acceptance.

The participants expressed concern about who should carry out the evaluation to ensure its objectivity and credibility and that the results are directed at and will influence decisionmakers. They were uncertain about the scope of evaluation, whether it should be comprehensive or partial, and raised concerns about the type of information indicators can and should provide, and about the skills and expertise needed to design reliable, technically sound evaluation instruments. Finally, they voiced concern about how to coordinate the standards of evaluation procedures to permit comparisons between institutions.

Policy Implications

Developing countries should strive to create an evaluation culture that is voluntary and is seen as a means of addressing problems. Nonconventional, participatory approaches that could facilitate the spread of such an evaluation culture and suit the emerging needs of HE in specific countries should be explored. The evaluation system should be practiced on a nationwide basis as in Mexico, where evaluation of public universities falls under the auspices of a national council for planning of higher education, and academic evaluation is by peer groups of subject specialists.[2]

Donors can help fund studies to develop appropriate guidelines and instruments for evaluation and help to establish training activities to increase the number of local evaluation research experts in developing countries. For poorer HEIs funding agencies could supply basic infrastructure and facilities, upgrade laboratories, retrain teaching staff, and so on as a precondition to addressing evaluation issues.

Where foreign funding agencies undertake evaluation to determine whether aid should continue, existing internal assessments should be combined with external methods. Self-evaluation as part of the normal evaluation process will foster participatory approaches and will enhance the confidence and value placed on evaluation results.

Outcomes and Recommendations

In recent years the developing countries have questioned the World Bank's commitment to HE. This meeting provided an opportunity for World Bank staff to discuss and clarify their views on key issues in the HE sector with the principal actors and decisionmakers in HE in the

2. See Estrategia Para la Integración y Funcionamiento de los Comités Interinstitucionales para la Evaluación de la Educación Superior (Comités de Pares) and Evaluación de la Educación Superior, 1979-1984, publications of the Secretaría de Educación Pública.

developing countries. This candid exchange of views and experiences will form the basis for future cooperation and actions to improve the sector's quality.

The seminar revealed a diversity in countries' conditions, including their size, historical development, and level of and strategy toward economic development that has shaped the development, role, function, and the problems faced by their HE systems. Although many parallels in experience and needs emerged from the discussions, the seminar underscored the importance of in-depth, thematic, country and regional case and comparative studies in helping to define effective strategies for improving the quality of HE systems. The following sections group the issues discussed into those on which the participants generally agreed and those that generated controversy. However, two themes were not discussed in sufficient detail to identify key issues and isolate areas of consensus or divergence, namely, the structural diversification of HEIs and the relevance of HE to the labor market. The two are related and both have implications for access, financing, and regulatory policies. The existence of HEIs of different types, levels, and foci that offer courses of various lengths, makes it possible to absorb excess demand, channel applicants according to their academic preparation and ability, and link training to the labor market's different levels and needs more closely.

Discussion: Points of Consensus

Although all countries face problems connected with excess demand, financing, and management, the participants emphasized the diversity in country conditions, which implies a rich variety of possible policy options. Notwithstanding the variety of approaches and strategies possible, countries will need to address some common elements, such as more effective access policies and accountability and evaluation mechanisms; more integrated research, science, and technology policies; and more coordinated and targeted support, both internal and external, for higher education development.

Access

Selection policies influence the quality of educational outcomes. Selection for quality is necessary if HE is to produce the types of graduates that will push forward the frontiers of knowledge and technological innovation. HEIs need to develop better criteria for assessing students' potential for benefiting from HE and better performance-based measures of the outcomes of university training.

The developing countries must address the problem of excess demand for HE. One way is to establish different types and levels of HE to serve applicants' diverse academic backgrounds and the needs of the labor market. Each country will have to determine the appropriate balance between selection for quality and for social equity. Donors can play a role by supporting countries' efforts to improve the quality of their educational data, techniques to analyze such data, and ability to manage the tradeoffs between selection for quality and for social representation.

Accountability and Evaluation

The participants agreed that evaluation for accountability of how resources are used and for the academic outcomes of HE is essential for monitoring and maintaining quality. They favored some combination of internal evaluation and external peer review as a means of fostering trust and confidence in the evaluation process and ensuring the accuracy and reliability of evaluation results and their usefulness in promoting positive change.

Science and Technology

During the last two decades, an explosion of knowledge and technology has led to a revolution in products and processes. Linked to this is the growing importance of international

markets to national economic development. As the most effective engine for creating and disseminating information relating to research and technology, higher education has acquired global significance, with international quality standards for training and research. Nations that cannot raise their systems to international standards in these areas will find their prospects for economic development severely eroded.

Access to technology is increasingly crucial to development. Donor support through technical assistance could facilitate not only the transfer of specific technological processes, but more important, the knowledge and expertise to adapt and apply existing processes and to create new ones.

Targeted Support

While institutions at all levels in the HE sector must improve their performance, given the scarcity of resources, nations and the international community will have to target support to carefully identified key areas and institutions. While general frameworks are useful for analysis, aid and assistance should be based on current, relevant data and in-depth country case studies. Identifying the objectives of aid provides a focus against which to measure progress.

Targeted assistance could take many forms. Donors could sponsor specific projects (for example, through seminars, commissioned studies, or expert consultations), or provide assistance for specific processes (for example, establishing proper accounting, data gathering, monitoring, and evaluation procedures). Assistance could run the gamut from providing grants at the micro level (R&D allocation to individual scholars), supporting national centers of excellence, and strengthening regional networks, to facilitating international transfers of technology.

Discussion: Points of Controversy

The discussion centered on the relative role of public and private financing of HE, the effectiveness of student loans as a cost recovery mechanism, and the impact of centers of excellence and national or regional networks of HEI on research output and quality.

Financing HE

The participants recognized the private and societal benefits of HE. However, distinctions between the two are not clear-cut enough to warrant them as unequivocal criteria for making allocation decisions. They called into question the efficacy of student loan systems as a means of shifting the burden of financing to the beneficiaries of HE. The administration of such schemes has not always contributed to cost recovery, and in many countries the cost of initial processing and the later high default rates have added to the public burden (Brazil, Uganda). The general consensus was that government still has an important role to play in financing and providing HE, but that the role and relative effectiveness of other funding sources should be explored. Ultimately, however, the issue is not whether the financing of HE is public or private, but the impact of the source of funding on access, choice, quality, and equity.

Research and Development

The relative effectiveness and efficiency of national and regional centers of excellence, networks, and twinning arrangements still need further study and clarification.

Regional Recommendations

The discussions indicated a solid agenda for immediate research and future policy action and formulation. The following section breaks down the discussion by region.

AFRICA. The African HE sector is in crisis. During the last decade economic stagnation has reduced the resources available for HE. Foreign exchange shortages have curtailed purchases of instructional materials and equipment and undermined the maintenance of physical plants. The erosion of the purchasing power of staff salaries has caused many staff to seek employment elsewhere or to find outside jobs to supplement their incomes, thereby lowering the quality of teaching and research. The politicization of students has caused frequent disruptions and further undermined the quality of academic work. As a result, most African HEIs are unable to produce sufficient graduates with the skills necessary to make a meaningful and lasting contribution to the development process.

Issues of quality, equity, efficiency, and funding are problems many African HEIs face. However, given the huge size of the continent, conditions are too diverse and the problems too complicated to permit any generalizations. The content and approach of a regional follow-up seminar on increasing the effectiveness and efficiency of HE in Africa should take this diversity into account. Seminar preparation should begin with an in-depth diagnosis and evaluation of the current situation—what exists, what is working, what is not working—in a sample of countries in such pressing areas as finance, access and equity, governance, curriculum and staff quality, enrollment ratios, library and other facilities, and the relationship between HE and unemployment and/or underemployment.

Country priorities and seminar topics should emerge from the diagnostic studies. Likely topics would include (a) financing; (b) equity and access; (c) university-state relationships to maximize autonomy and academic freedom; (d) capacity building to improve effectiveness and efficiency, including donor assistance and collaboration with HEIs in OECD countries; and (e) the possibilities for enabling African universities to become centers for national development, especially in science and technology, and for employment generation. The seminar should highlight examples of successes and failures, discuss lessons for the future, and take care to document a broad sample of experiences and models (including francophone and lusophone countries and South Africa). The seminar should also draw upon international experiences of successful reform and how these could be adapted and applied to the African context. The implementation of Castell's science and technology model in various country contexts would be a useful case study.

The seminar should be geared toward the preparation of country action plans that identify country goals and priorities while taking into account political and cultural influences; identify constraints to achieving goals; and devise and operationalize appropriate strategies to overcome the constraints that eventually set out costs, potential funding sources, and a time frame for implementing improvements.

ASIA. Economic interdependence and rapid technological change characterize the Asia region. The region's HE systems have an important role to play in facilitating change and helping to integrate advanced training and research with shifting economic realities. Asia is also characterized by differences in levels of development and HE priorities and strategies between countries. Experiences with HE vary widely from more developed Thailand and Malaysia, to Indonesia, the Philippines, and Pakistan. Needs should be addressed based on each country's situation.

Nevertheless, some issues cut across differences in country conditions. The existence of historically disadvantaged and minority groups make equity, social group representation, and the quality of outcomes perennial concerns in most countries and color approaches to financing, governance, and access. Another common issue is what form vocational and technical education should take, where it should take place, and at what point in the educational cycle. Yet another is whether HEIs are producing graduates with the right mix of skills for national development.

Past development planning has been *ad hoc*. More systematic planning for development and innovation is needed. Research and evaluation should play a more important role in guiding actions in light of development goals. Funding for research is needed to develop new models to integrate public and private institutions, to improve admission policies and curricula so that

they take labor market conditions into account, and to develop new HE structures to accommodate students with different academic abilities and preparation. These models should be linked to the development of evaluation strategies and techniques to monitor, review, and direct reforms. External funding agencies should facilitate these efforts by providing financial and technical assistance.

The participants came up with a number of specific suggestions as follows:

- Measures to improve the quality of curricula and of instructional materials are paramount.
- Models should be developed to diversify the structure of HE. This will require research to help clarify policies and approaches and to ensure that those approaches adopted will improve the efficiency and relevance of HE.
- Labor market analysis should be integrated into admissions and curriculum development policies. Such analysis should emphasize the growing importance of scientific knowledge and technological know-how.
- HEIs need to improve resource allocation and use and explore better strategies for recovering costs.
- To facilitate the foregoing actions, ongoing research and evaluation capacity needs to be strengthened and institutional incentive structures put in place in the areas of diversification of financing and institutional structures, management of change and innovation, labor market needs, and science and technology development.

THE MIDDLE EAST. In the Arab countries the increasingly difficult economic situation is caused by declining oil revenues and decreasing remittances from migrant labor in the region and in Western Europe, thus threatening the continued growth of the region's education systems. The flow of returning labor, which competes for scarce jobs or is not appropriately trained for those jobs that are available, together with high population growth rates, is placing additional demand on already strained education budgets. Governments are under pressure to use limited financial resources more efficiently. The HE sector, in particular, is on the defensive. Research indicates that it is elitist and isolated; emphasizes success in examinations to enter university, which distorts and narrows what is taught and learned in secondary school; produces a supply of graduates and type of research that does not correspond to demand or to its cost to society; and has a scale and structure that results in persistent shortages of manpower in some priority fields and surpluses in others.

In this context, the most relevant issues to be addressed in the region are as follows:

- The increasing social demand for HE means that open versus selective access and mass versus elite universities are pressing issues. Modern and more flexible methods of provision, such as open universities and distance learning, are attractive options for consideration.
- A number of issues need to be clarified and rationalized: the legal status of universities, the role of government, and the effect of private sector and other sources of funding on universities' autonomy. Topics such as self-financing and cost recovery need further study and documentation to identify better practices.
- As concerns the management of universities, topics for investigation should include managing resources, physical infrastructure, libraries, and laboratories; developing staff and curricula to meet the labor market's needs; evaluating student outcomes and institutions; and improving accreditation.
- The participants advocated an expanded role for universities in providing integrated training, research, and extension services to the community and in promoting economic development and a commitment to society and the environment.
- The vision of the university is that of society's "brains trust," simultaneously a repository and generator of human knowledge and ideals. Such a vision favors the internationalization of the role of universities through professional exchanges,

links, and networks between countries at all levels of development. The sharing of successes and failures in areas of common concern would facilitate positive change.

LATIN AMERICA. The agenda for further work in HE in Latin America emphasizes how to maximize the use of existing scientific knowledge and technological capacity in an increasingly strained economic environment. In most of Latin America the basic human and physical infrastructure is already in place, but it is rapidly becoming obsolete. The participants identified four priority topics for a follow-up seminar to help educators in the region think through the available policy options as follows:

- The first priority is to increase advanced training, especially at the doctoral level, by establishing networks between institutions (Erasmus model).
- The second priority is to modernize and expand the current base of human and physical infrastructure, emphasizing equipment, teacher exchanges, and information networks between universities.
- The third priority is to strengthen linkages between HE and the productive sector through such mechanisms as providing risk capital for technology-intensive firms, initiating cooperative research between universities and industry, establishing research centers in firms, and creating technology parks.
- The fourth priority is strengthening institutional mechanisms in planning agencies, with special attention to implementing projects and linkages with the productive sector.

SMALL ISLAND STATES. The experience of universities operating in small island states answerable to more than a dozen governments is unique. The small size of their economies and their "islandness" (small-scale economies, populations, and political structures and often isolated landmasses) add to their special character. The specific nature and scope of universities in small island states means that they are under more pressure to establish external links, develop a critical mass of expertise, maintain professional and intellectual legitimacy, and devise mechanisms to avert pressures to compromise their legitimacy from specific client groups. The burden of being the catalyst for national and regional development is ever-present in institutions of this type.

A follow-up seminar for small island state universities should focus on closer examination of the following issues:

- The major issue is to achieve an adequate rate of expansion in relation to social demand and to assess its implications for faculty quality and deployment, and to examine the quality and scope of research programs and the quality and capacity of physical and research facilities. This is particularly important as the mission of universities in small island states has evolved along the lines of Castell's model (diffusion of ideas, formation of elites, training of manpower, and advanced research), changing and shifting emphasis partly in response to the pressures for expanding access.
- A general preoccupation is how to maintain entry standards in the context of expansion. Approaches to consider are structural differentiation; training of trainers to overcome weaknesses, especially in the fields of mathematics and science; setting standards based on internationally accepted norms; and defining guidelines for special concessions for historically disadvantaged groups.
- Critical concerns with respect to governance are how to determine the most effective balance between state and university administrative authorities and, within HE, how to determine the relevance of curricula, the appropriate balance between teaching and research and between basic and applied research, and how to advance the role of the university in national development, especially in science and technology.

- As concerns efficiency, the dilemma is to maintain efficient use of resources while maintaining qualitative objectives. Efficiency issues will have to be addressed at the policy level through admissions and finance policies (cost recovery, privatization) and at the operational level through evaluation mechanisms, networks, regional centers, and use of new information technologies and delivery systems.
- Questions about financing concern who should pay (students, government, private sector, external donors), for what training and research, through what type of mechanism (loans, grants), and at what point in time.

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Appendix 2

SEMINAR PAPERS

Keynote Address

Higher Education and Economic Development by I. G. Patel

Papers presented

(Requests for papers should be made directly to the authors.)

The University System: Engine of Development in the New World Economy
by Manuel Castells

Foreign Assistance For University Development in Sub-Saharan Africa and Asia
by Thomas Owen Eisemon and Moussa Kourouma

Access to Higher Education
by Robert Klitgaard

Problems of Privatization
by Daniel C. Levy

Mechanics of Allocating Public Funds to Universities: Their Implications on Efficiency and Equity
by Edita A. Tan

Performance of Higher Education, Measurements for Improvement, Evaluation of Outcomes
by Ulrich Teichler and Helmut Winkler

Autonomy and Accountability in Government/University Relationships
by Frans A. van Vught

Background Papers

Higher Education and the Markets for Educated Labour in LDCs: Theoretical Approaches and Implications
by Ake Blomqvist

A Classification of Systems and Institutions of Higher Education
by Burton R. Clark

Higher Education Finance in China: Current Constraints and Strategies for the 1990s
by Min Weifang

Recovering the Cost of Public Higher Education in LDCs: to What Extent are Loan Schemes an Efficient Instrument?
by Alain Mingat, Jee-Peng Tan, and Monzurul Hoque

Appendix 3

SEMINAR PROGRAM

Monday, July 1, 1991

Keynote Address:		Higher Education and Economic Development
Session	I:	Access and Equity Issues in Higher Education
Session	II:	Improving Quality and Efficiency

Tuesday, July 2, 1991

Session	III:	The Evolving Relationship between Government and Universities

Wednesday, July 3, 1991

Session	IV:	Financing Higher Education Development: Sources of Funding
Session	V:	Private Provision of Higher Education

Thursday, July 4, 1991

Session	VI:	Scientific Research and Higher Education: a Global Survey

Friday, July 5, 1991

Session VII: Strategies

A: Formulate statements of priority concerns and policy strategies to deal with them

B: Propose further action for regional and international collaboration

Appendix 4

SESSION PAPERS

1. Patel, I. G. *Higher Education and Economic Development: Keynote Address.*
2. Castells, Manuel. *The University: Engine of Development in the New World Economy.*
3. Verspoor, Adriaan M. *Improvement and Innovation in Higher Education.*

2

KEYNOTE ADDRESS: HIGHER EDUCATION AND ECONOMIC DEVELOPMENT

I. G. Patel

Debates about higher education have become part and parcel of the so-called revolution in economic thinking and economic policy that characterized the 1980s in developed and developing countries alike. Higher education is predominantly a public sector activity. If the public sector is now suspect and public expenditure and intervention are generally to be reduced, can higher education—or indeed education itself—be exempt from this scrutiny? Should not expenditure on higher education be justified in terms of its relative costs and benefits to society? Is there any reason why the share of higher education in total public expenditure or in total national expenditure should continue to rise rather than remain the same, or even decline? Whatever the level of expenditure, should it not be incurred judiciously, that is, with due regard to efficient and cost-effective use of the resources employed and the social relevance of the results achieved? Does not concern for efficiency imply a radical change in the management of higher education, with greater emphasis on performance and accountability, and perhaps a reduction in the traditional autonomy of universities?

Indeed, if expenditure on higher education has to be justified on grounds of efficiency and comparative social rates of return, does this not argue in favor of differential support for different institutions in consonance with differences in their efficiency? Should not rewards for individual teachers be similarly differentiated by results rather than set nationally in terms of general norms of age, experience, and training already received? To carry the argument further, should higher education be thought of primarily in terms of universities as we traditionally know them, or is there need and scope here for allowing "a thousand flowers to bloom?"

If competition as a spur to efficiency also has a role to play in higher education, should we not let private institutions develop, and indeed encourage them by providing them with public support, at least to the extent of the support enjoyed per student in comparable public institutions? A well-recognized principle of public finance is that even if a service is to be provided at public cost, it need not actually be provided by public agencies if the private sector can provide the same service in a more cost-effective manner.

Once the private sector is allowed to extend into this hitherto traditionally public sector activity, other questions arise, notably, those concerned with equity. All democratic societies value education as the means for bringing about social mobility and reducing differences in income, wealth, and opportunity inherited from the past. Thus, education cements the forces of national unity and a sense of common national purpose so essential for the very survival of democratic governments. But is the present system of higher education really equitable in the sense that it promotes social mobility and greater equality of opportunity? If not, can it be made more equitable, at least in a limited sense, by making those who receive it pay at least part of the costs of their education? The temptation to think so is great when government budgets everywhere are strained. However, a system of partial payment for higher education by the

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students themselves raises deeper questions of equity that cannot be resolved easily. More often than not, equity and efficiency make strange bedfellows.

The questions raised are not just hypothetical or theoretical questions. They are the stuff of heated public debate around the world, most notably in the United Kingdom. These are important questions and will be asked with increasing vigor in the years to come.

Having been in the thick of these debates for six years as director of the London School of Economics and Political Science (LSE) from 1984 to 1990, I have, of course, acquired my own point of view on these questions. In addition to the six years at the LSE, I was director of the Indian Institute of Management at Ahmedabad from 1982 to 1984. However, my experience of university teaching is almost nonexistent. Thus, my perspective is more that of a manager than of a teacher. My exposure to higher education as a student has been extensive, but was confined to some of the more elite institutions: Bombay; Cambridge, England; and Harvard. When it comes to higher education then, I am likely to be an elitist. By contrast, I have been on the other side as well, being a finance man for most of my life: an economic adviser, finance secretary, governor of the Reserve Bank, and deputy administrator of the United Nations Development Programme. I have been accustomed, as such, to giving money as grudgingly as anyone else. Well, not as grudgingly, perhaps, as Margaret Thatcher, but grudgingly nonetheless.

You will appreciate, therefore, that I have some difficulty in balancing the arguments within myself. You may well find that much of what I have to say falls uncomfortably in the middle, but that is the nature of the beast, and I make no apology for recommending a gradualist and evolutionary approach that nevertheless has a clear sense of general direction. More seriously, I believe that a synthesis of old and new ideas with some forward-looking initiatives toward greater regional and international cooperation and a more imaginative use of the newer technologies offer the best way forward for most developing countries.

The Aims of Higher Education

Above all, in this field more than in any other, we need to avoid the fashionable route most loudly proclaimed by the revolutionaries of the extreme right. Life is something more than mere economics, and this is true of no other field as it is of education. Let us not be mesmerized by the notion that higher education is an investment good with a productivity in economic terms higher than that of most other investments. This may have been true of the past, and may or may not be so in future, but the central point about higher education is that unlike other forms of capital such as machines, higher education has returns that far transcend mere economic returns. These returns are the very substance of what development is all about, that is, the quality of life in its totality, including individual dignity, self-respect, and command over one's own life, which are the true hallmarks of individual freedom. These returns are difficult to quantify and to compare with economic returns, but they are nevertheless real. They are even more important than the so-called nation building consequences, which are at best means to an end.

Thus education, and higher education in particular, is part and parcel of the human endeavor for a more civilized existence. There is, therefore, a fundamental democratic or humanitarian sense in which education of every kind and level should eventually be made available to everyone to the extent that he or she is capable of absorbing it, not just to those who are able to put it to the best use, whatever that may mean, but to everybody who can put it to some use. Not to each according to his ability only, but to each according to his needs as well. Quality and quantity are thus both important, and have to be reconciled as far as possible. Therein lies the rub. However, the essential principle of equality in universality is indisputable and is a logical extension of the so-called Robbins Principle as applied to higher education in the United Kingdom. For more than a quarter of a century his dictum that higher education should be available to all those who can benefit from it has held the stage despite its perhaps conscious ambiguity. Its egalitarian ethos naturally extends to a certain uniformity in public support to different institutions and a more or less similar structure of rewards

throughout the system. At the same time, resources are limited and higher education has to compete with alternative uses. When it comes to higher education policy, this brings us to a central dilemma: an unavoidable conflict between the legitimacy of everwidening ends and the reality of limited resources.

An Approach to Policy

Such a situation can only be resolved by compromise, to work out some optimum solution, but one should not make too much of economic analysis in arriving at an optimum solution. When no simple tradeoffs are available, economic analysis can at best illuminate. It cannot provide an answer by itself.

In practice, at least in democratic societies, a variety of motives and interests will enter policy. Where one is concerned with deep-seated issues of equity, autonomy, accountability, and elitism, change is bound to be slow as old attitudes are often grounded as much in good sense as in prejudice or vested interests. Education policy is, in any case, only one part of overall social and economic policy, and one must ask whether general objectives, such as equity, need to be pursued equally vigorously in every field of endeavor, or whether a case exists for tolerating some inequity in some spheres as long as the overall policy framework is slanted toward greater equity. What is true of equity is, of course, equally true of efficiency. It is only one of many good things and pursuing it relentlessly in every field may not be wise.

To put it differently, when change is needed on many fronts the limited resources of social resilience have to be deployed carefully. One has to choose the battlelines carefully, and traditional education may not be the outpost to be overrun first. The future is always uncertain, and calls for caution and a gradualist approach in a field as far-reaching as higher education.

Even the so-called consensus of the 1980s on broad economic policy issues is beginning to fray at the edges. In the Mecca of the British New Right, the devout themselves have committed the sacrilege of abolishing the poll tax. Yet, in theory, no better tax than the poll tax can be devised if one is concerned only with economic efficiency. The poll tax distorts nothing and can be evaded or avoided only by voluntarily ceasing to be; not a very likely occurrence.

What is more, despite the new wisdom that there is no such thing as development economics and that the same policies work in industrial and developing countries alike, clearly some problems need to be tackled much more urgently in the developing world. Questions of quality of education, of unemployment among the educated, of social relevance, of how much education to import and how much to produce at home, and of the need for positive discrimination in favor of those deprived of opportunity for long periods in the past are likely to be more urgent and more difficult to resolve in newly-emerging, poor democracies than in well-established, affluent societies. While the problems among developing countries will also differ, we should not import the controversies of the North uncritically into the South. Much less should we borrow solutions wholesale from them.

At the same time, what is happening in the United Kingdom and elsewhere is relevant for Malaysia and India, and even Viet Nam and Zambia, which is why one has to be open-minded about the kind of issues outlined at the start of the chapter. What is not in doubt is that we all need to be better educated about education. We simply cannot take things for granted when what is at stake is the quality of life for generations to come. If this argues for more analysis and more information and more questioning, it also argues for a very critical look at what might purport to be new findings or new guiding principles.

The Common Ground

Some issues do not entail any great controversy. Most industrial countries may have reached the stage where the case for reducing, or at least holding steady, the share of government expenditure in total national expenditure is overwhelming. This is certainly not the case in most developing countries. There is, therefore, no intrinsic reason why the share of education in

total national expenditure cannot increase significantly in most developing countries during the foreseeable future.

I also believe that no one any longer maintains that developing countries cannot afford the luxury of higher education. One has only to look at the profiles of the jobs that need to be done to see why one cannot simply stop with secondary education, let alone primary education. Where will the teachers for the schools, or the doctors and engineers, or the higher civil servants and diplomats be trained? These jobs cannot be manned by expatriates for ever, nor can countries train all their people abroad for ever.

In addition, higher education is necessary to satisfy some of the higher aspirations of a society. Historians, archaeologists, and writers chronicle the past and present in a way that shapes the future and nurtures the roots that bind communities together. Universities—students as well as teachers—everywhere are uniquely motivated to keep alive the values of freedom and universality. Witness tyrants' fear of university campuses and how universities everywhere traditionally transcend purely regional or national loyalties. Universities are, in general, also the greatest source of change, not just technological change, but social and cultural change.

No rules are available that can tell us how the kitty for education must be divided between primary, secondary, and tertiary education. There may be some point to making calculations that compare rates of return to primary versus secondary education or secondary versus tertiary education, but the different stages of education are mutually complementary, and returns change with time as they are very much the product of relative scarcity. Common sense tells us that a broad-based structure of primary education is necessary for secondary education to take off, just as secondary education must be grounded in a sound and extensive system of secondary education. Thus, the structure of education will always be a pyramid, although one may hope that eventually it will resemble a cube. How fast this "cubic transformation" can take place is a question that can only be answered on an individual basis. What one can say is that even though there is a logical sequence from primary to secondary to higher education, we cannot wait until the first stage is fully in place before we start to build the second and third stages. Most people would agree that more or less universal education up to the primary and secondary stage should be provided as soon as possible, without neglecting higher education altogether in the meanwhile. Higher education accounts for some 20 percent of total public expenditure on education in most countries, and there is not much reason to suggest a significant shift upward or downward.

The question of the pace at which higher education should expand is clearly more complicated. The very rapid pace of expansion of the past two or three decades obviously cannot continue. For a variety of reasons, the party is over and some "reversal of fortune" for higher education—and indeed for education in general—has to be accepted as a practical necessity in most developing countries. To be more precise, the rate of increase in public expenditure on higher education will be somewhat slower in future than in the recent past.

This does not mean, however, that the share of education—including higher education—in total public or national expenditure should remain unchanged, much less that it should decline. Without invoking the somewhat dubious calculations that purport to show that higher education is more productive than other forms of public expenditure, one can make two points. First, even if health or preservation of the environment, for example, are serious contenders for public attention along with higher education, surely areas like administration, defense, or internal security deserve even greater scrutiny than higher education. Second, and this is often overlooked, higher education enjoys and deserves to enjoy an even higher priority in private expenditure than is reflected in current reality. If only this private propensity could be properly invoked, it could permit an increase in the proportion of national expenditure devoted to higher education.

There is now increasing recognition that we need not make much of the distinction between vocational and general education, between specialists and generalists, or between natural sciences and social sciences or humanities. I doubt if questions such as priorities within higher education for different disciplines can be decided based on calculations of the private or social

rate of return on the study of, say, economics as against medicine. As in the case of industry versus agriculture, or small-scale versus large-scale production, or exports versus import replacement, we need both, and we need both generalists and specialists as well. It will not do to ridicule one or the other by clever arguments. I remember being told that a specialist is one who knows a great deal about very little and goes on to know more and more about less and less until he knows everything about nothing. The obvious retort is that a generalist is one who knows a little about many things and goes on to know less and less about more and more until he knows nothing about everything. Most of us, I think, are content to fall short of both these ideals.

This is not to say that questions of priorities within higher education are not important. Clearly, each society has to choose whether to have one more medical school or five schools of business administration, and developing countries can make gigantic mistakes for the sake of false prestige, as my country did when it spent more money initially on research in physics and space technology rather than on agronomy and biology. However, questions of priority within higher education cannot be decided in either/or terms as skills are complementary and society's needs are many and diverse. Nor can they be decided with reference to rates of return as social returns are difficult to compare and private returns are not all that relevant except in the context of financing higher education. When it comes to priorities within higher education, one has to adopt a common sense trial and error approach, learning from experience elsewhere, and above all, from debates among professionals. The main merit of higher education surely must be that it develops the same professional attitude of objectivity and sensitivity to evidence among practitioners of all professions.

Can we then decide on priorities within higher education in terms of some assessment of future needs, or some kind of manpower planning? On the face of it, this seems sensible considering the extent of unemployment among the educated and the waste inherent in a mismatch between supply and demand. Indeed, some degree of planning in higher education is unavoidable as it is in all activities that take years and vast resources to complete and the benefits of which are spread over a number of years. All one can say is that such manpower planning and, even more, the allocation of resources in accordance with such planning, must be not watertight, but open-ended in many ways. We all know the difficulties of forecasting and the pitfalls of excessive planning. The future is uncertain. The only certainty is that there will be many changes from the past, so that flexible or adaptable skills are more the answer than precise, but narrow, skills. Higher education is also not just an instrument of the public good. It is also a private prerogative of each citizen, so there must be room left where different tastes, temperaments, and absorptive capacities can breathe freely without being obsessed by private financial or social rates of return.

One thing that is peculiar about higher education is that its practitioners are notoriously oblivious of competition in terms of financial rewards. They choose instead to form their own noncompeting groups within which competition is fierce, but in terms of their own standards, set by their own peer groups, and not by anyone outside. Civilization is enriched essentially by those who refuse to compete in every market, but choose instead a niche of their own, be it in art, literature, learning, or a life of service. True, civilization also needs for its sustenance and enrichment those who are driven more by acquisitive instincts. Both have their place, and the priorities in higher education must provide room for all.

A related question of priorities concerns research as distinguished from teaching. No one believes that research is a luxury for developing countries or that it can be done in some second-class manner. Developing countries have problems and priorities not shared by others. To develop acceptable and economic forms of family planning, to conquer tropical diseases, or to make local products more competitive at home and abroad are challenging tasks for the most gifted of scientists. In addition, social science research in societies bedeviled by differences of caste, tribe, religion, and cultural sophistication is likely to be more difficult, not less. Whether research and teaching always go together or can usefully be separated to some extent is a question on which opinions will differ, but I suspect this is a less serious question in developing countries, where current standards of both teaching and research are generally so

low that there is room for experimentation in devising a suitable institutional framework for improving both.

One can also safely assert that in developing as well as in industrial countries, higher education will in future provide, indeed demand, a much greater diversity, not just in subject range, but in terms of institutional arrangements, how subjects are taught, and how research is done. The concept of a university offering degrees with precise and somewhat stylized courses taught within a specific time frame and with periodic examinations to assess and establish performance and ability will perhaps persist for many years to come, especially in developing countries. However, private institutions are already becoming more important in Latin America and parts of Asia where higher education has already advanced a good deal and where so much demand goes unsatisfied. With the aim of meeting the demand as cheaply as possible will come experiments in modular degrees, evening classes, correspondence courses, private diplomas, and a burgeoning of all kinds of tutorial arrangements.

In such rapidly changing times, education is a lifelong process, so that short courses provided either by universities, business firms, or specialized private and public agencies will become more necessary and more common. How to finance, regulate, and supervise such a diverse structure in the interests of quality and economy while responding to varying and changing needs is a question that requires more attention.

Let me state one more proposition. While higher education is crucial, it is by no means a panacea for all ills, and one should not judge it with reference to impossible criteria. I remember thinking seriously when I was young that most of our national ills in India—such as harmful social customs like dowries, religious and caste or linguistic conflicts, disregard for law and order and a general absence of civic sense, or a lack of concern for the weak and disabled—would disappear with the spread of education among the masses. Nothing of the sort has happened. Indeed, in some ways the educated are the worst offenders and rationalizers. The issue is as old as civilization; knowledge is not wisdom. Plato thought education or knowledge would make people reasonable, but reason alone is not a sure guide. The rational are not always reasonable, and, as is well said: the heart also has its reasons which reason does not know.

What is more, education is only a part of overall social and economic policy, and it cannot compensate for the infirmities of policies in general any more than it can radically alter basic human propensities. One can only hope that it can make some difference for the better.

Area of Dissent

I have spent some time spelling out what I think would be generally accepted to counteract the tendency in many seminars to focus on differences and controversies. However, it is not my intention to suggest that there are no serious issues in higher education where there is no clear consensus. On the contrary, it is precisely because some major issues remain to be more fully debated and decided that seminars like this one are important.

Among the unsettled questions in higher education where we need a balanced approach that is not yet clearly defined, I would mention the following, which overlap in some ways:

- The precise connotation of the concept of efficiency,
- The right balance between autonomy and efficiency,
- The conflict between efficiency and equity or between quality and quantity,
- The financing of higher education,
- The proper management structure for higher education.

The concept of efficiency in higher education clearly has two aspects. Resources must be used efficiently in the sense of obtaining the maximum output per unit of resource. Second, supply must reflect demand. However, maximizing output per unit of resource is not a simple matter, and there is a danger here of circular reasoning. Generally this kind of argument leads to an endorsement of increasing the number of students per teacher or, at times, even of restraining teachers' salaries, both dear to budget cutting bureaucrats and politicians. But increasing quantity by reducing quality makes no sense. Both quality and equity, for example, can be

increased by providing residential accommodation for teachers and students at subsidized rates rather than by letting them fend for themselves in overcrowded urban conglomerations, but this will increase the cost per student. Should we therefore frown on it? Nor can simplistic notions like this take account of the diverse needs of society. The fact that doctors cost more to produce is no reason for stinting on producing them. Even when appropriate, comparisons of cost must include total cost to the community rather than to the exchequer, something that is seldom done and is not easy to do in any case.

This is not to deny that costs can be cut, by more intensive use of buildings, for example, but petty economies generate more annoyance than they are worth, and academics are better left alone to do their own thing rather than to keep accounts and fill in forms. A more promising approach is through greater use of modern technologies. More secretaries can work at home, and tutorials, and even lectures and discussion sessions, can in part be replaced by tapes (students at LSE, I am told, do brisk business by taping lectures anyway). Distance learning and open universities deserve more attention. They can more easily draw upon material produced by the best universities abroad. This is one area where universities in more advanced countries can contribute to the quality and cost-effectiveness of higher education in developing countries.

The issue of a mismatch between supply and demand is also not simple. We are obviously not speaking here of effective demand only as understood in economics. Demand for some disciplines like medicine and the priesthood may have to be created if it does not exist for reasons of cost or rewards.

What is more important, much of higher education is, or should be, flexible as there is always scope for substitution and adaptation over time. A temporary mismatch in the form of unemployment cannot be avoided when change is the order of the day. Such a mismatch has to be met by remedial training rather than by changing the educational profile, except perhaps to make education a more versatile tool generally. This is one reason why conceptual or theoretical modes of instruction that address the "why" of things are better than practical modes that concentrate on the "how" of things, as the former permit better adaptation to changing situations whereas the "how" of things dates relatively quickly. It is undoubtedly true that developing countries produce far too many unemployable graduates or graduates with very little added value, but this is because the quality of education is low, and not because the educational profile is necessarily wrong.

Concern for efficiency requires more than taking steps to reduce costs without reducing quality. The actual results achieved need to be assessed, and perhaps rewards for individuals and institutions adjusted in response to such assessment. This question of efficiency and performance audits conflicts with universities' traditional autonomy. However, the area of conflict can be reduced in several ways. First, the respective spheres of responsibility—and hence of autonomy—for different constituents of the university need to be clearly established and respected. Universities consist not just of teachers, but also of students and managers, and the management structure often includes not just paid staff, but government representatives and people prominent in public life. They each have a specific responsibility, and hence a claim for autonomy. Second, even where primary responsibility rests elsewhere, there should be participation and discussion, but a clear distinction needs to be drawn between the right to participate and the right to decide. Third, much of the sting of an audit can be taken out by making it primarily internal.

In passing, one cannot help remarking that the talk of autonomy sounds rather hollow and ironic in most developing countries, where government intervention is rampant even in matters concerning appointments and promotions. Even the lay representations reflect not public or professional eminence, but political patronage. Such autonomy as the teachers and students enjoy is exercised not in committees, but in agitations of the most disorderly kind without any restraint in canvassing the most indefensible forms of self-aggrandizement. Thus, teachers agitate to prevent any proper assessment before promotions and students press for easier examinations and better results.

This issue aside, reconciling autonomy and accountability is possible by using the principles I just outlined. Students, for example, have every right to assess their teachers' performance,

that is, the quality of their teaching. Teachers cannot resent such assessment in the name of autonomy. The quality of research must also be assessed, not just by peer groups, but also in terms of consumer preference and confidence as measured by research contracts or consultancies. All evidence of teacher performance must count when the time comes to renew contracts or tenure or grant promotions and salary raises. These cannot be settled merely in terms of the passage of time. Even if teachers' overall performance is finally judged primarily by teachers rather than by administrators, lay governors, or government representatives, the process must be credible and objective. This may well require not just the use of external assessors, but also the acceptance of rotating internal assessors.

I am not in favor of differential rewards for individual teachers. This generates conflict and discord, which can be counterproductive, but by the same token, strict standards must be applied when it comes to increments, or promotions, or renewal of contracts and granting of tenure. Universities must also be more tolerant of teachers earning income from outside. One test of a good leader or director is the skill with which he or she allows different teachers different degrees of involvement in outside work without creating jealousy or neglect of duty.

However, when it comes to what to teach and how to teach it, what to do research on and how to carry it out, and what standards to set for examinations, teachers must have the final say even if administrators, lay governors, or even students participate in the discussion. By the same token, teachers cannot dictate how many students to take or how much of everything must be taught or researched on in the aggregate. Questions of total resources to be employed and of financial management must be the prerogative of the administration, government representatives, and lay governors. Expenditure audits, in general, can be made more acceptable by including teachers, and even students, in the process and by using objective criteria, but the final say on the budget has to be with the governing bodies and not with directors or teachers.

In short, autonomy, efficiency, and performance audits are all important, but each in their respective sphere and when exercised in an appropriate style. In my experience, it is not that difficult to avoid or bypass militant trade unionism by assuring genuine participation and involvement, and one can get teachers' and students' support for a sensible audit system if one succeeds in creating confidence that it is objective, even-handed, and, within limits, participatory.

Unfortunately, despite much governmental interference in everything, including appointments and promotions (and perhaps because of it), the system of efficiency and performance audits of higher education leaves much to be desired in most developing countries. This is undoubtedly one of the main causes of high costs and poor quality. The situation has actually deteriorated so much that not many people are willing to accept the post of vice chancellor, which used to be so prestigious not long ago. Restoring a semblance of management and managerial autonomy by rolling back government intervention and political patronage and making students and teachers responsive primarily to purely educational criteria are perhaps the greatest challenges to higher education in many developing countries.

Even more worrisome, perhaps, are the appallingly low standards of quality in most institutions of higher learning. In the understandable desire to spread higher education as widely as possible, standards have been allowed to fall, and few institutions are of world class in most developing countries. It is, of course, not just that resources are spread too thinly. The problem goes even deeper. Very few developing countries have the manpower and other resources required to develop really world class institutions, and in a way poor quality teaching and research is worse than none. Given that the demand for higher education is strong and, in one sense, everyone has a right to such education irrespective of absorptive capacity if only society could afford it, how do we reconcile the conflict between quality and quantity?

The simplest way to improve quality would be to have very high admission and instruction standards. This would achieve many things at once. It would reduce the rate at which expenditure on higher education expands. Available resources would be concentrated in a fewer institutions, which would make it easier to maintain and improve quality. Even today, admissions to medical and engineering colleges are severely restricted by merit, and this has been generally accepted as necessary. One should be able to apply similar planning to the

hundreds of commerce departments and replace them by fewer, but more credible, schools of business management. One can at least insist that government supported institutions have certain minimum admission standards. That is the only way to assure that higher education leads to sufficient value added to deserve the epithet of "higher."

Such an elitist approach has many disadvantages that can, however, be countered, at least to some extent. Those who are rich and do not qualify to enter highly subsidized public schools will gravitate to private commercial establishments, or even go abroad, and the really poor seldom go in for higher education as they can ill afford to forego the income they might otherwise earn. The really bright among the poor and the not so well-off can be taken care of by scholarships that must, however, be large enough to cover maintenance as well as fees, and when institutions are fewer, maintenance costs will be higher as students might have to live away from home.

If education beyond the school level enriches individuals' lives and widens their mental and spiritual horizons, the best way to provide it to the masses is not through full-time university degree courses taken away from home between the ages of eighteen and twenty-one or more. Short courses outside office hours, programs like the Workers' Education Programme in the United Kingdom, and training organized by employers (if necessary with government support by way of tax concessions) are likely to be more effective. All this should also be eminently feasible in this age of television. Building not more universities, but more facilities for continuing education, including libraries, is the answer for satisfying the legitimate hunger of the many for some exposure to higher learning.

With high admission and instruction standards, there could be a shortage of students to admit, but this will spur improvements in the quality of secondary education, which is all to the good. There might also be a need for positive discrimination in regard to admissions for some historically disadvantaged groups, but this can be accommodated in a system with high admissions and instruction standards if we are prepared to have remedial courses in advance of admission as well as after.

If standards of admission and instruction are pitched very high, small countries may not have the scope for even a single institution for some disciplines, but it is high time we extended notions of regional cooperation to higher education in any case. Apart from the immediate educational gains, throwing together young men and women from neighboring countries may well provide a more lasting basis for mutual regard and cooperation on a wide front. The potential for regional cooperation in higher education is considerable even between large countries such as Bangladesh, China, India, and Pakistan, and needs to be seized in the interests of regional peace and prosperity.

The shortage of qualified teachers in universities can be met by training some young men and women abroad. Of all the forms of harmful do-it-yourself protection, insistence on training everyone only at home is perhaps the most harmful. Yet many countries do exactly this in many ways: by not having sufficient scholarships for study abroad, and even by limiting access to foreign exchange. Such practices are largely self-defeating. By all means let us insist on high standards for qualifying to receive the scholarships or for access to foreign exchange, but let us not have arbitrary limits in terms of the level of degrees to be taken abroad or the particular courses to be pursued even at private expense.

In this context it is a great pity that barring a few countries such as the United States and France, most industrial countries are becoming inhospitable to students from developing countries. Fees for them have been increased greatly, and even the United States has a quota system for bright students from some parts of the world. Funds available for technical assistance should be used to train young people from the developing countries in universities in donor countries and to strengthen the best institutions in the receiving countries. Even the World Bank and private foundations underestimate the importance of financing graduate studies at the world's best universities for bright students from developing countries. What is true of teaching is even more so for research. Indeed, the research agenda of European or American universities must increasingly include problems of concern to the developing countries as the resources required can be found more readily in the North than in the South, and if good

scholars from the South are associated with such research in the North, so much the better. The scope for international cooperation in raising the quality of higher education in the developing countries is so vast that we have only begun to scratch the surface. Twinning of institutions in the North and the South, for example, not just cosmetically, but with a genuine transfer of skills and resources, has great potential if only the aid establishments and international agencies were willing to consider such initiatives as the most vital part of their assistance.

As an alternative to training abroad, but without giving up strict standards of admission and instruction, countries such as India have experimented with specialized institutions outside the main university system as a kind of oasis in the ocean of mediocrity. The institutes of management, of technology, and the specialized research centers, such as the Tata Institute of Fundamental Research, on the whole constitute a successful experiment (some might say too successful, as many of the products seem to get jobs or scholarships abroad without much difficulty). These elitist institutions do cost much more per student than normal universities, and there could be scope for some scrutiny here. Some of the purely research institutes should also perhaps do more teaching. By and large, however, such experiments make sense, and one should not forget that the only alternative to such privileged institutions is training abroad.

In short, in the struggle between quality and quantity, I come out strongly in favor of quality while modifying some of the adverse consequences by appropriate remedial action. One has unfortunately to recognize that democratic societies cannot easily resist the urge to do the most popular things in the short run no matter how expensive they may prove in the long run, but that is all the more reason to explore alternative approaches.

On the question of financing higher education, I am largely in favor of maintaining the status quo, that is, keeping it essentially as the government's responsibility. This largely reflects the great importance I attach to higher education and the scope I perceive for raising revenues and for economies elsewhere. The alternative approaches, in my judgment, are either inappropriate or infeasible at this stage of development, or are already adopted to a greater extent than is often realized. One should also consider that if the government has to take on public opinion and do the unpopular thing, it would do better to begin by insisting on higher admission and instruction standards than by shedding its fiscal responsibility.

I am also firmly of the opinion that public funds can be supplemented by private contributions provided such contributions are seen as a worthwhile addition to, and not as a replacement for, the public sector's legitimate responsibilities. Take voluntary donations by individuals or businesses, for example. These are forthcoming in large measure even today and are encouraged by tax concessions. They are more likely to be forthcoming for capital expenditure and scholarships than for universities' recurrent expenses, and they respond to specific or local appeals more than to general appeals. University vice chancellors should be encouraged to raise part of the requirements for their pet schemes of expansion from private sources, but good vice chancellors already do so, and know that it can only be done for something new and not for maintaining the old.

Similarly, business contracts and public consultancies can put more resources in the hands of universities, but these additional resources should go to the individual teachers concerned rather than to the institutions. This is the major way to reward individual performance in systems of national wage setting and to attract and retain high quality staff. If they so wish, universities can levy a proportionate charge on such outside income for the facilities provided, but I would much rather that universities willingly provided such facilities to increase outside consultancy and other income to support their endeavor to become elitist institutions by attracting the best staff. If they succeed in doing so, money will follow in many ways.

Or, take again the much talked-of question of student fees or parental contributions. In my opinion, people make too much of the fact that the upper- and middle-income groups benefit the most from a university education. I do not doubt that this is so, but to a large extent it cannot be helped. The poor cannot afford to forego earnings, especially in poor countries. Looked at another way, the middle classes who flock to the universities in developing countries are not all that affluent and they do make great sacrifices to keep their children at universities, first,

by spending a good deal of their own money to send them to good schools so that they can get admission to good universities, and second, not only by foregoing the support of their children, but by paying for their maintenance, books, and the like. Higher education may be subsidized, but it is far from free, and there is something insensitive about thinking of the middle classes as privileged in countries like India, where the middle is only just above the minimum. It is this class that hankers for upward social mobility more than any other, perhaps because it has just managed to afford at least a part of the price of such mobility. To stop them in their tracks when our countries need skilled people in every walk of life makes no sense socially or nationally. I suspect this is true to some extent of Malaysia as well. Yes, someone has to pay, but in the aggregate the middle classes pay for a fair share of government expenditure, and we need not pursue equity blindly in every walk of life. What may be true of the United Kingdom or the United States may become true of Malaysia, and even India, in the years to come, but we are not quite there yet.

This is not to say that countries should not experiment with fees to some extent. I think there is a case for much higher fees in some of the elitist institutions like the international institutes of management and technology in India, and those who cannot afford their fees can be given scholarships. However, if some institutions are allowed to charge higher fees, the proceeds should remain with the institutions and not reduce the government's involvement. That way, a certain sense of institutional solidarity or pride can be invoked: directors should be able to say that if they charge higher fees, they give more scholarships, have more books in the library or more computers in the classroom, or pay their teachers more, and not that they have to charge higher fees to reduce the burden on the taxpayer. One test of a truly elitist institution is that it can charge more than others.

If students need help, I would favor outright grants, some of them by the universities themselves from the funds they raise or generate from within. The ability to do so will be another test of a truly elitist institution. Loans to the needy are more trouble than it is worth, and I am surprised that this simple lesson is not learnt despite the experience of a debt crisis among some of the more advanced developing countries. A grant to those with merit and in need rather than a loan may seem unfair in relation to those who do not go to universities anyway, although I would question even this. However, it is certainly fair in relation to others who do go to universities, but are in no real financial need. Why should a rich student have no loan burden while a poor student does when both have passed the same test of merit?

For the same reason I do not favor vouchers to everyone wanting to go to university, whether public, private, or mixed. Why not vouchers to everyone of a certain age then, irrespective of whether they want to study further or not? One could argue that vouchers will generate more competition from private institutions, and thus make for efficiency. I am afraid this is too simplistic a view. Higher education is far too expensive to be made privately profitable unless it is reserved for the rich or is of very poor quality. If private effort needs to be encouraged, it can be done in other ways, for example, by making it tax free, and even by allowing tuition fees to be tax deductible to some extent, but we do not have to put private and public institutions on a par in terms of public support, if only because supervising private institutions and making them publicly accountable will be too great a task for most developing countries. This consideration becomes all the more relevant if public institutions insist on high admission and instruction standards. Once again, we need not be beguiled by the circumstances of countries far ahead of us in wealth and talent. Scarcity demands concentration if quality is to be enhanced, and if this means less competition, other means to encourage efficiency must be found, and in education at least, quality is not that difficult to assess, if only because the international market in higher education is more open than other markets.

Finally, just a few remarks on the appropriate style of management for higher education. The present situation is so unsatisfactory that one has to begin by reversing many trends: too much governmental interference, rampant trade unionism of students and teachers, and indifference of or inappropriate interference by lay governors whose interests are anything but educational. My views on the management of higher education are greatly influenced by the style of management at the London School of Economics, which I consider to be one of the best

examples of the right mix of participation and decisiveness. It is based on a clear, if conventional, notion of the appropriate sphere of responsibility of each constituent of the school, students, teachers, and lay governors, none of whom represents the government, but many of whom have been civil servants and know what accountability in the public domain is. Styles by their very nature evolve as a result of patient effort over the years and cannot be produced at will in a standard design on the drawing board. Nevertheless, there have to be certain underlying principles, and I can think of none better than those I referred to earlier when discussing how to reconcile university autonomy and efficiency audits.

A keynote address is expected to strike a theme note for the seminar. In trying to do so, I have spelt out some general principles, as well as areas of agreement and possible disagreement. What I have kept in mind are the highest aims of higher education and the undoubtedly sad realities in most developing countries. If I have stuck my neck out and expressed my views rather forcefully, it is in the hope of provoking discussion. The issues that confront us in higher education in developing countries are of paramount importance to our future, and they deserve nothing less than the most patient and penetrating discussion.

3

Improvement and Innovation in Higher Education

Adriaan M. Verspoor

The Challenge

After a lull of more than two decades, the contribution of higher education to countries' technological progress and economic development is once again attracting the attention of economists (Reich 1991; Starr 1988) and development agencies. The World Bank's 1991 *World Development Report* argues that technological progress and increased productivity are closely linked with investment in human capital and the quality of the economic environment. The report concludes:

> The opportunity for rapid development is greater today than at any time in history. International links, in the form of trade and flows of information, investment and technology are stronger now than forty years ago. Medicine, science and engineering have all made great strides; the benefits are available worldwide (p.11).

Scientific and technological capabilities are, however, distributed highly unequally in the world. Developing countries account only for 13 percent of the world's scientists and engineers, and only 4 to 5 percent of global spending on research and development, and most of this small share is concentrated in a few countries: the East-Asian newly industrialized economies (NIEs), Brazil, India, and Mexico (Castells 1989).

Institutions of higher education and research are central to a nation's capacity to connect with the new international knowledge system and adopt, adapt, and further develop the new technologies. Yet in many developing countries they do not play this role effectively. Enrollments have skyrocketed while funding has stagnated (table 3-1). Many of the brightest students from developing countries avoid their national universities and enroll in universities in industrial countries. Many of them, especially those with advanced degrees, are reluctant to return because of the absence of research facilities, unfavorable economic conditions, or political considerations.

In large parts of the developing world higher education is in the midst of a crisis: the quality of teaching and learning has dropped far below international standards and research activities are underfunded and often of questionable merit. Once famous institutions such as the University of Dakar, the University of Ibadan, Fourah Bay College, the University of Lahore, and the University of Buenos Aires are today only faint images of their illustrious past. Intellectually most developing country institutions of higher learning are peripheral to the international scholarly community, although individual scholars continue to do outstanding scientific work.

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Table 3-1. Average Annual Growth of Enrollment and Public Recurrent Expenditure on Higher Education, 1980-88

Income group	*Enrollment (percent)*	*Expenditure (1987 US$)*
Low income	8.8	-12.3
Lower-middle income	6.6	-9.1
Upper-middle income	6.1	-4.6
Higher income	4.3	0.9

Notes: Number of countries in the sample: twenty-eight for low income, twenty-eight for lower-middle income, eight for upper-middle income, and twenty-three for high income.

Source: United Nations Educational, Scientific, and Cultural Organization, World Bank, and International Monetary Fund files supplemented by World Bank country reports.

The crisis in higher education has affected not only low-income countries in Africa and South Asia, but also middle-income countries in Latin America. Its manifestations usually include overcrowding, inadequate staffing, deteriorating physical facilities, poor library resources, and insufficient scientific equipment. The consequences are poor internal efficiency, graduate unemployment, and limited scientific output (Salmi 1991; Zymelman 1990). The crisis partly reflects the economic adversity that many developing countries experienced in the 1980s, but it is also a crisis of policy, or very often of lack of policies.

The prospects for economic growth in the 1990s, although better than in the 1980s, remain modest for most of the developing world outside East Asia. Economists project that real growth of per capita GDP will be at most 0.5 percent in Sub-Saharan Africa and less than 0.3 percent for all developing countries taken together, although sound economic and social policies could result in higher growth. Nonetheless, in the 1990s higher education policy in most developing countries will be made in a context of severe constraints on public resources. In this environment, policymakers will be faced with hard choices if they are to increase the potential of higher education to contribute effectively to development. Moreover, small countries will need to devise strategies to overcome the effects of economies of scale, especially in scientific research and graduate training, and the countries of Central and Eastern Europe will need to redefine the objectives, processes, and structures of higher education in the context of their transition to market economies.

The Seminar

The World Bank has been an important source of external funding for higher education development since the early 1960s (table 3-2). It has funded 387 higher education components in eighty-nine different countries at a total cost of about US$6 billion, with the Bank's share amounting to some US$4 billion. Countries increasingly seek World Bank assistance to fund programs to reform and improve higher education.

In Brazil, for example, the Bank has provided two science and technology loans to promote research capacity and postgraduate training related to national industrial needs. A national research council was established to award funds on a competitive basis to quality research programs. Similarly, in the Republic of Korea the Bank has provided sustained assistance to upgrade scientific capacity at all levels of education, but particularly at the university level. A series of loans has improved scientific education, engineering training, and scientific research.

In Africa, where university quality has deteriorated sharply in recent years, the Bank is supporting university revitalization. In Nigeria, universities are increasing the efficiency of

Table 3-2. Costs of Higher Education Components in World Bank-Supported Education Projects by Institution, Fiscal Years 1963-90

Type of institution	Total		Africa		East Asia		South Asia		Europe, Middle East, and North Africa		Latin America and the Caribbean	
	US$ millions	%	US$ millions	%	US$ millions	%	US$ millions	%	US$ millions	%	US$ millions	%
University	3,046	50.2	304	48.3	2,109	58.5	131	27.0	461	39.6	42	23.3
Polytechnic (3 years instruction)	752	12.4	34	5.4	349	9.7	219	45.2	123	10.6	27	15.0
Technical institute (2 years instruction)	1,256	20.7	167	26.5	525	14.6	89	18.4	384	33.0	91	50.6
Teacher training (secondary, vocational instruction)	1,012	16.7	125	19.8	625	17.3	46	9.5	196	16.8	20	11.1
Total	6,066	100.0	630	100.0	3,608	100.0	485	100.0	1,164	100.0	180	100.0
Of which Bank loan	4,041	66.6										

Source: Education and Employment Division of the World Bank's Human Resources Department review of education project Staff Appraisal Reports.

their resource use, eliminating inefficient programs, diversifying their resource base, and purchasing the equipment and materials necessary to improve the quality of instruction and research. Similarly in Kenya universities are mobilizing private funds through a student loan scheme and increasing the efficiency of resource allocation through improved management practices.

In China the Bank has approved eight loans to support the development, expansion, and quality improvement of a diverse set of higher education institutions, ranging from elite national universities to provincial universities, a national television university, and vocationally-oriented polytechnics.

Many of the Bank's programs are designed to help governments deal with difficult dilemmas, for example, choices concerning access versus quality, autonomy versus accountability, equity versus efficiency, public versus private funding, and basic versus applied research. Much of the analysis on which governments base their choices on these issues is moving into what is for many countries and agencies uncharted territory. Strengthening the analytical basis for national strategic decisions on higher education is thus a high priority for many developing countries.

World Bank assistance for education development goes beyond financing investment projects. It includes support for policy analysis and applied research. In recent years World Bank policy work has combined broad consultations with policymakers in the developing world, donor agencies, and the international academic community with in-depth analysis of empirical evidence from industrial and developing countries. In this context the World Bank invited a group of senior higher education officials from twenty-two developing countries and representatives of international agencies and university associations to participate in this seminar to discuss priorities and strategies for higher education policy in the 1990s. This overview summarizes the seminar's eight central messages. They are likely to affect profoundly the Bank's analytical work on higher education and may shape the terms of the discussion on higher education policy reform in the next few years.

1. Country conditions shape the nature of policy analysis in higher education. The wide variation in the problems countries face are related to the historical roots of their education systems, the differences in levels of development and development strategies, and the size of their population. Clearly national policies will reflect these cultural and socioeconomic variations and agency financing policies must have the flexibility to respond effectively to different country needs. No universally applicable prescriptions are available. Policy researchers will have to develop an understanding of how the specific problems of higher education that a country faces evolve as it develops. Identifying policy options and understanding their effectiveness contingent on various country conditions can help policymakers make informed choices.

2. The crisis of higher education is first and foremost a crisis of quality. This crisis is far from uniform, and even where it is most severe, pockets of excellence still exist the midst of mediocrity. On the whole, however, universities in developing countries face an urgent qualitative challenge as higher education has become an international system, with the "gold standard" largely being set by the leading American research universities. Patel (chapter 2) stresses the importance of quality considerations in higher education policymaking. Castells (chapter 4) reinforces this based on the premise that no country can afford to be completely out of touch with this international system.

   Financial and human resource constraints will often make the systematic pursuit of quality in research and teaching difficult for many developing countries. Patel suggests that putting quality institutions on a sound footing will in many instances require encouraging regional cooperation, increasing the use of modern instructional technology,

and complementing public subsidies with private contributions. Most critical, however, will be maintaining high admission and instruction standards.

3. A capacity to undertake scientific research and apply the findings to developmental problems is an important aspect of quality in higher education. Research institutions and universities that are involved in research activities will need to be connected to both the world's scientific networks and their country's specific needs and productive structure. Castells (chapter 4) addresses this point, emphasizing the central role of universities in building endogenous technological capabilities that are critical at a time when development is increasingly technology driven.

   With increased scientific and technological competence, universities will be able to perform their developmental function better and move beyond their traditional goals of transmitting values, selecting elites, and training people for the civil service. The demands of development in the 1990s and beyond will require an emphasis on the often neglected functions of higher education: the generation of scientific knowledge and technological know-how and the training of highly skilled manpower for all sectors of the economy. Like Patel, Castells argues that few countries will be able to make this transformation in isolation. He agrees that regional cooperation is essential, but adds that to succeed regional programs or centers of excellence need to be anchored in strong national universities.

   High quality systems manage the interaction between science, technology, economy, and society effectively. Building national capacities to manage science and technology will, however, require more than strengthening university research and training. It will also require establishing close linkages between universities, research centers in the country and abroad, and the production sector. The performance of individual institutions will be greatly enhanced by such linkages.

4. High standards imply selectivity in admissions, but equity concerns must modify purely meritocratic selection procedures. Klitgaard in his paper demonstrates the complexities of positive selection and quota systems based on a detailed analysis of the experience of the University of the Philippines. He brings home the point that countries need to move beyond easy equity rhetoric and to consider two issues.

   In the first place, selection problems are most severe in systems of higher education that have rigid academic programs, lack institutional diversity, and have difficulty in getting rid of nonperforming students. Improved performance assessment, opportunities for students to move flexibly between programs (for example, through a credit system or easy access to diploma or open university programs), and the ability to discontinue enrollment of low performing students would all help to ease the severity of the selection problem.

   Furthermore, for affirmative action or positive selection programs to succeed beyond admission they will usually need to be accompanied by support and assistance to students from historic and economic minority groups. Several good examples of effective strategies in this regard were presented in the discussion of Klitgaard's paper, including the efforts of the University of Science (Malaysia) to establish linkages with area high schools and offer advanced mathematics and science instruction in an effort to prepare native Malaysians (Bumiputras) for its program.

5. The emphasis on quality means that evaluation of teaching and research in terms of process and outcomes becomes critically important. However, few developing countries have well-established evaluation traditions. In addition, they have tended to use evaluation as a tool for supervision and management control rather than as a tool for learning from experience. In their contribution Teichler and Winkler emphasize the importance of paying attention to the prevailing national "evaluation culture" and the need to design evaluations in such a way that they improve the environment for future

evaluations. They also recommend striving for a balance between direct evaluation approaches and information gathering that serves evaluation more indirectly.

Experience shows that attempts to measure institutional performance directly are limited and are likely to generate considerable controversy. More promising are recent experiences in Western Europe (see, for example, Kells 1991) with self-evaluation and institutional research that combine the elements of the four evaluation methods Teichler and Winkler discuss. This approach could form the basis for the design of institutional self-improvement strategies. Mexico is considering this approach as an element of its criteria for allocating incremental funding.

6. Considerable work needs to be done in the area of financing and resource mobilization. Full public financing of higher education—while theoretically questionable—might have been feasible when higher education was reserved for a select few and public resources were relatively buoyant. At a time when higher education systems in many developing countries have become mass institutions (Trow 1972) with broad training and knowledge generation functions, this financing arrangement is no longer feasible, and has even become counterproductive in its effect on the quality of teaching and research. In her paper Tan sets out the basic arguments for sharing the burden of financing higher education more equitably between private and public sources of funding.

   Much work remains to be done to clarify the economic arguments that can help determine the level of government support for higher education and the conditions under which public subsidies can be justified. As Tan points out, this means that policymakers need to gain a better understanding of the societal and private benefits of higher education. Other questions relate to the effects of various subsidy allocation mechanisms on institutional efficiency and equity. Finally, major questions remain about the efficiency with which available resources are used. In many instances countries are giving priority to student support and staff salaries to the detriment of equipment, teaching materials, and books.

   In many developing countries private institutions are enrolling a rapidly increasing number of students. While expressing support for an extension of private higher education, Levy describes the problems associated with private institutions in his paper. Most important, he points out that private higher education actually has almost a symbiotic relationship with the public sector. The private sector usually has a clearly delineated role, avoids expensive disciplines, and borrows faculty from public institutions. The vital question, Levy argues, may not be how private institutions perform individually, but rather how they affect the whole system.

   Nonetheless, private institutions can provide important lessons about flexibility, efficiency, and responsiveness to demand that the public sector should examine. Ultimately, ownership may be a much less important determinant of effectiveness than management style and system structure. Work on economic issues will have to move beyond examining the traditional issue of public versus private financing to exploring how each sector can provide higher education programs effectively and efficiently and how private and public resources can be combined to the best advantage.

7. Another area where current practice should be rethought concerns strategies for external support. The data presented in Eisemon's paper are admittedly fragile, but they do suggest that the international donor community may be robbing Peter to pay Paul. The well-justified concerns about developing primary education may have led donors to reallocate funds to primary education at the expense of higher education. Disjointed aid strategies that ignore the complementarities between the different parts of the education system are obviously not rational, and may actually be harmful. In recent years development economists have increasingly emphasized the critical importance of human resource development for alleviating poverty and making economic progress, but

aid allocations have not reflected this emphasis. External assistance to education remained stable in the 1980s. The time may have come for donor agencies to re-examine current aid allocation patterns and see whether indeed they are helping developing country governments to do less of what they should not be doing (for example, the production of most goods and services) and do more of what they should be doing (most notably, human resource development), and do that better.

However, the strength of the case for increased assistance to education is also contingent on governments' and donors' willingness to reassess the effectiveness of current education aid programs. As regards external aid to higher education, Eisemon finds that it has become increasingly fragmented between institutions and programs. Most important, little goes to develop universities or to strengthen institutional capacities to undertake training and research.

Finally, in the same vein as Patel, Eisemon argues that support for low-cost higher education using unconventional strategies and new technologies should go side by side with sustained and concentrated support for selected programs of excellence.

8. The challenges that face higher education throughout the developing world call for rethinking the traditional relationship between governments and universities. Central planning and control of higher education has resulted in uniformity, rigidity, and politicization of the system at a time when diversity, responsiveness to evolving development demands, and faculty and student commitment to institutional objectives of quality and relevance are essential. Drawing on public administration and innovation theory Van Vught presents the case for the devolution of central control. He argues that the most effective way for governments to manage higher education is through institutional self-regulation within broad policy priorities and incentives defined by the public authorities. In this model the state sees itself as a supervisor steering from a distance and using broad terms of regulation. Van Vught summarizes his views as follows:

> Governments should provide the general (not so detailed) rules within which institutions can use their autonomy and within which the market can function. The institutions should try to maximize their innovative capacities within the context provided by government. The market should be used to let societal needs come to the fore.

Patel and Eisemon also emphasize the importance of increased institutional autonomy—combined with effective procedures for ensuring accountability—as a key step toward improved quality and efficiency. The case for the devolution of government as argued by van Vught is compelling, although views about where the boundaries are vary. Further research in this area is urgently needed and should focus on identifying strategies, policy setting, and good linkage practices in terms of institutional arrangements and incentive structures.

The presentations and discussions at the seminar highlighted the general direction of policy reform in higher education. The main dimensions are reasonably clear: emphasis on quality in research and teaching, diversity in institutional missions and programs, selectivity in admissions with deliberate efforts to promote equity, diversification in sources of funding, efficiency in resource use, responsiveness to social demand, and experimentation with new low-cost modes of higher education. The presentations demonstrate a remarkable degree of consensus on the desirability of relaxing government policy controls, and the benefits of increased institutional autonomy and accountability and improved "quasi private" management practices. The challenge is to strengthen and fine-tune this framework by gathering evidence about what works and under what conditions it works best. The key elements in this research agenda are:

- Re-examining higher education's contribution to technological progress and economic development;

- Identifying strategies for mobilizing resources and sharing the burden for developing higher education;
- Rethinking the state's role in financing, providing, and regulating higher education;
- Investigating countries' experiences with increased institutional autonomy and market-type delivery mechanisms;
- Assessing strategies for regional cooperation;
- Investigating options for using technology and low-cost mass delivery mechanisms.

Translating this research agenda into policy options will require researching the experience of those countries and institutions that have succeeded in maintaining the quality of their higher education in the face of increasing social demand and decreasing public resources. Documenting policies that have been demonstrably effective will inform policymakers in those countries facing the need to reconcile quality and equity considerations under conditions of financial constraints.

The research agenda proposed above is formidable, but if research is to contribute to policy, investigating these issues must be a high priority for higher education researchers and policy analysts.

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4

THE UNIVERSITY SYSTEM: ENGINE OF DEVELOPMENT IN THE NEW WORLD ECONOMY

Manuel Castells

Science and Technology as Sources of Economic Growth in the Information-Based Economy

Science and technology play a critical role as sources of economic productivity and competitiveness in the new, informational economy (Monk 1989). Furthermore, the growing interdependence of service activities with manufacturing and agriculture place information processing at the core of productivity growth (Hall and Preston 1988). Thus, dramatic innovation in information technologies in the last two decades has made technological capacity even more crucial for economic development and political power. Because the adequate use of advanced information technologies is highly dependent upon the general level of education and culture of labor, there is a growing connection between people's intellectual skills and their countries' development potential (Carnoy and others 1982).

This analysis is not limited to market economies. The groundbreaking econometric studies by Soviet economist Aganbegyan (1989) show that the decline of the Soviet economy from 1971 to 1985 (which ultimately forced the policy of *perestroika*) was linked to the exhaustion of the extensive model of growth, through massive addition of labor and physical resources, as the Soviet economy became more complex and needed improved technology and better management to perform in the next stage of development. This next stage was characterized by the importance of information generation and information processing outside the secluded military industrial complex.

However, some authors argue that less developed economies are less concerned about advanced technology as much of their activity is still linked to traditional agriculture, semi-industrial handicraft production, and petty trade. Besides, advanced technologies tend to be labor saving, while the major problem in developing countries is to create jobs for a population still growing at an excessive rate. Yet, this argument forgets that today the world is closely interconnected, and that the process of development does not proceed stage by stage, but must instead be based on the proper linkages between national and regional economies with very different technological compositions (see Geledan 1990).

The informational economy is also a world economy, in which comparative advantages in terms of labor costs only become important once a given national economy is connected to the rest of the system on the basis of a sufficient level of communications, productive infrastructure, and labor skills (see Sewell and Tucker 1988). Because of the growing interpenetration of economic processes worldwide, economies that try to reach out beyond the subsistence level (thus generating some surplus) will immediately face a highly sophisticated international economy in which technological capacity is a critical variable. Unless we adopt the ideological position of full self-sufficiency, which would be hard to implement for political reasons in a world linked by television and tourist travel (Castells and Laserna 1989), the informational economy must be considered a worldwide phenomenon, with an asymmetrical structure, in

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which countries and regions are integrated at very different levels, furthering the system's segmentation and aggravating societies' contradictions (Ohmae 1990). In such a worldwide, informational economy we must rethink the meaning and instruments of development (see Portes and Kincaid 1990). It would seem that investment in what is called "human capital" becomes strategic, but the concrete policy implications of such a statement are more complex and less accepted than would appear at first sight.

This chapter elaborates on one of these implications: universities (but not any kind of university) become fundamental tools of development. However, they do so in a very different way to the old humanistic approach to development in terms of improving literacy and fulfilling the developing world's cultural needs.

The science and technology systems of the new economy (including, of course, the humanities) are equivalent to the factories of the industrial age. Not that manufacturing will disappear, but the new manufacturing of the twenty-first century (as well as agriculture and advanced services) will only be able to perform on the basis of a new, highly developed cultural, scientific, and technological system (Cohen and Zysman 1986).

If knowledge is the electricity of the new informational international economy, then institutions of higher education are the power sources on which the new development process must rely. This is the central proposition of this chapter.

High Technology and Development in the World Economy

During the last two decades the world economy has been transformed by two major interrelated factors: the growing importance of international markets to national economic development in a context of growing functional interdependency between countries throughout the world, and a major technological revolution in products and processes at whose core are new discoveries and applications in information technologies (see Gamella and Hernandez de Felipe 1990).

The growing internationalization of the economy concerns trade as well as capital, labor, management, and technology, but it is international trade that has become the driving force in the process of economic growth (see Deardorff and Stern 1986). Between 1960 and 1987, rates of growth in international trade have consistently outpaced rates of growth of world output. National performance has become more dependent on the expansion of international markets.

The performance of exports by region is highly differentiated, with East Asia experiencing fast growth (annual average growth rate of 6.7 percent in 1980-89), South Asia growing at a moderate rate (3.2 percent), while Latin America and Sub-Saharan Africa saw their economies decline (-0.6 percent and -2.2 percent, respectively). Analyses by individual countries confirm the close relationship between international trade and economic growth (Dahlman 1989; Fajnzylber 1988; Frischtak 1989), reversing the traditional link between import substitution and national development.

Furthermore, most of this trade depends on the performance of exports from developing countries in the markets of the Organisation for Economic Co-operation and Development (OECD) economies, as is shown by the close resemblance between the evolution of such exports and that of industrial production in the OECD. Indeed, a close analysis of the structure of international trade shows that export performance depends upon two major factors: the importance of manufactured goods in total exports from the developing country, with countries specialized in agricultural commodities and raw materials being penalized by the deterioration of the terms of trade; and the added value and relative competitiveness of the manufactured goods, as most of the trade between developed and developing countries takes place within the same product groups. Thus, to the traditional unequal exchange between manufactured goods and primary commodities we must now add another source of disparity in terms of different technological composition (and thus different value) among the same kinds of manufactured goods (for example, some countries designing chips, others assembling them) (Castells and Tyson 1989).

This new structure of international trade, and the corresponding new international division of labor, takes place in the context of a major technological revolution that fundamentally reshapes the emerging global economy. The main effects of the revolution in information technologies on the structure and dynamics of the world economy are described below (Castells 1986; Dosi, Pavitt, and Soete 1987):

- The technological infrastructure that permits the daily operation of the global economy as a unified system operating in real time. Without telecommunications, computerized transportation, electronically organized air travel, microelectronics-based flexible manufacturing, and automated information-based management systems there would be no global, integrated economy, but just a process of increasing interaction between national or regional economies.
- High technology sectors (that is, the industries producing the new devices, most of them related to information technologies) are the fastest growing sectors in the world economy, for example, the electronics industry grew at an annual average rate of 13 percent between 1965 and 1985. Thus, countries able to be producers in such industries enjoy a growing share of world markets, while countries that must import high technology-based products (both in capital goods and in consumer goods) see their balance of trade deteriorate accordingly.
- Technological capacity determines export performance for national economies because of industries' dependence on their technological level for their competitiveness. Econometric studies by Dosi and Soete (1983) have provided empirical evidence for forty industrial sectors of the OECD countries indicating that these sectors seem to play a much lower role than does technology in conditioning competitiveness. Castells and Tyson (1988) reach much the same conclusion for developing countries, while Ernst and O'Connor (1990) emphasize technology's fundamental role in explaining the competitive export performance of the newly industrializing countries in the last twenty-five years.

Therefore, it seems plausible to state that:

- The development process takes place today in a fully interdependent world economy that in the 1990s will include the formerly planned economies in transition toward some kind of market economy.
- International trade plays a fundamental role in economic growth. This statement does not only refer to the predominantly outward orientation of the fastest growing economies, but it also emphasizes the need for each economy to be able to import the goods and services required to modernize the country in a context of rapid technological change and instant worldwide communication.
- Competitive manufacturing is critical (both for export performance and for the ability to absorb imports) for successful development in an increasingly open economy.
- National development depends to a large extent on the technological infrastructure to manage the economy, including the ability to link up with worldwide information systems.

Overall, technology, particularly information technology and the wide range of its applications, becomes the fundamental factor in the development process under current historical conditions (see Soete 1985).

Technology Transfer And Endogenous Technological Development: The Role of Universities

The current dependence of development on the technological potential of each country has serious consequences for much of the world, because science and technology are distributed

around the world extremely unevenly (see Johnston and Sasson 1986), as illustrated by table 4-1. Furthermore, the well-known brain drain phenomenon (Altbach 1987) aggravates the structural gap, concentrating the best scientists and engineers in a few countries, and within these countries in a few institutions and firms. This self-reinforcing trend creates the foundation for the most fundamental inequality in wealth and power.

However, if countries can set up a process of technological advancement, traditional obstacles, such as a lack of natural and energy resources or a small domestic market, become less important. Developing economies can benefit substantially from their quick access to high technology if they are able to sustain such an effort, as demonstrated by the competitiveness in the electronics industry of the newly industrializing countries in the Asian Pacific (Castells forthcoming), as well as the ability of educated Mexican workers in American automobile companies in northern Mexico to reach productivity levels comparable to their American fellow workers (Shaiken and Herzenberg 1987).

Thus, technology has become a development tool of paramount importance, but is one of the most unevenly distributed capacities in the world, and access to technology (or technology transfer) is now at the core of development policies. By technology transfer I mean the incorporation in the economy, firms, and institutions of a developing country of advanced processes and products that cannot be generated and/or produced at a given moment by that country's enterprises.

A developing country can benefit from technology transfer in several ways (Bianchi, Carnoy, and Castells 1988):

- Import of machinery with the instructions and training for using it;
- Acquisition of licenses to design and produce the necessary equipment;
- Acquisition of know-how by training scientific and technical personnel by sending students, scientists, and technicians abroad to universities, government institutions, or foreign companies;
- Acquisition of know-how by inviting foreign experts to national universities or scientific or industrial organizations;
- Acquisition of know-how by training national personnel in foreign companies located in the country;
- Location in the country of technologically advanced foreign companies that produce at least partly for the local market.

Each form of technology transfer has its strengths and weaknesses from the point of view of the developing country. The main limit to reliance on import policies is the burden on the balance of trade. However, sending students and technical personnel abroad risks that they will never return home unless they areoffered conditions of work comparable or better than those found in the host country, which is rare.

Attracting high technology multinational firms to the country is one of the most successful ways to upgrade the technological and managerial industrial structure of a given country quickly, but such a policy also has its shortcomings. Multinational firms are not eager to let their best technology get into the hands of potential future competitors. In addition, their decision to locate in a developing country is made taking their whole production structure into account, and therefore they do not focus on the market or industrial needs of a given country. Similarly, the training of foreign personnel is limited and controlled according to the firm's internal needs. Very often multinational firms are economic enclaves without real linkages to the local productive structure. However, cases of technology transfer from multinational firms to developing countries exist, but they depend on the bargaining power of these countries (either as advantageous locations or as potential markets) and on the policies these countries are able to set up concerning foreign firms.

Despite these various shortcomings, developing countries must attempt a combination of these strategies of technology transfer to be able to link up, at some point and to some extent, with the globally integrated, advanced production system. However, technology transfer can only be effective if the country has a process of endogenous technological development that can

Table 4-1. Scientific and Technical Manpower Potential: Estimates for 1980 and 1985
(number per million people)

Region	*1980*	*1985*
World	79,187	18,200
	110,760	23,442
Africa	1,052	2,593
	1,623	3,451
America	27,692	45,243
	37,993	56,956
Asia	22,925	8,944
	32,670	11,686
Europe (including the former Soviet Union)	26,733	35,714
	37,369	48,600
Oceania	785	36,941
	1,105	48,213
Industrial countries	58,903	52,753
	81,247	70,452
Developing countries	20,284	6,272
	29,513	8,263
Africa (excluding Arab states)	243	831
	469	1,376
Asia (excluding Arab states)	22,588	8,985
	32,103	11,730
Arab states	1,146	7,046
	1,721	9,143
North America	24,178	96,023
	33,247	126,200
Latin America and the Caribbean	3,514	9,754
	4,746	11,759

Source: United Nations Educational, Scientific, and Cultural Organization data.

receive, support, and use the know-how being transferred (see Ernst 1980). The traditional opposition between endogenous and exogenous technological development is ideological and empirically wrong. No country can today innovate entirely by itself in the midst of a major technological revolution, and even less so if the country does not belong to the OECD area of technologically advanced economies. Without substantial technology transfer on a world scale, the gap between this small part of the world and other countries will grow exponentially, leaving islands of modernity in an ocean of backwardness. However, for such technology

transfer to trigger development, countries need a basic, supportive structure that, in essence, can be reduced to the following elements:

- An adequate system of communications and telecommunication linkages at the world level.
- An integrated productive structure, where suppliers and markets operate, at least for the advanced segment of the economy, at a similar technological level. In other words, a modern firm without an adequate network of suppliers and ancillary firms can only be an enclave, unable to contribute substantially to the country's development, and ultimately unable to be competitive.
- A skilled labor force of workers, technicians, engineers, and scientists able to adapt their skills continuously to the fast pace of technological change.
- A research system able to assimilate the discoveries taking place in the most advanced areas of the world, adapt them to the country's specific needs, and gradually be able to participate in international scientific networks.
- An institutional system able to link scientific research, technical applications, and training of the labor force in the context of a process of technology transfer.

Without the fulfillment of these conditions to sustain an endogenous process of technological development, the exogenous impulses received through technology transfer will not be assimilated.

Clearly institutions of higher education, both public and private, are critical for endogenous technological development. They must provide the skilled labor force that is needed for technology transfer and technology development, both in terms of specific skills (for example, engineering) and in terms of general learning ability; they must generate the scientific foundation and the research and development (R&D) activities that will be necessary to connect with the process of knowledge generation throughout the world; they will have to adapt innovations produced in other contexts and for other needs; and they will have to perform such tasks in close connection with the industrial structure, but with a level of autonomy that will enable them to take the necessary long-term view for scientific strategy and educational planning.

Experts tend to agree on the increasingly important role of universities in technology-led economic development (Rama 1984). Yet universities are systems whose internal logic and social dynamics cannot be easily adapted (even newly created universities) to the new historical role they are being called upon to play in the global information economy. Thus, to examine the interaction between economic development, technological transformation, and higher education we must analyze the structure and functions of universities as social institutions.

An Analytical Framework: Universities as Dynamic Systems of Contradictory Functions

Universities are institutions that in all societies, throughout history, perform basic functions that are implicit in the role that is assigned to them by society through political power or economic influence. These functions result from the specific history of education, science, culture, and ideology in each country. However, we can distinguish, at the theoretical level, four major functions whose specific weight in each historical epoch defines the predominate role of a given university system and the specific task of each university within the overall university system.

First, universities have historically played a major role as ideological apparatuses, rooted in the European tradition of church-based universities, either in the statist version of the French, Italian, or Spanish universities (closely linked to the religious orders, to the Roman Catholic Church, and to the national or local states), or in the more liberal tradition of theological schools of the Anglo-Saxon variety, ancestors of the liberal arts colleges. The

formation and diffusion of ideology has been, and still is, a fundamental role of universities, despite the ideology of their ideology-free role.

However, we must consider this role in the plurality of ideological manifestations. Ideological apparatuses are not purely reproductive machines, as seen in the functionalist theory exemplified by Bourdieu (1970). They are submitted, as Touraine (1972) has shown, to society's conflicts and contradictions, and will therefore tend to express, and even amplify, the ideological struggles present in all societies. Thus, both conservative and radical ideologies find their expression in universities, although the more the ideological hegemony of dominant elites is established in society at large and the more conservative ideologies tend to predominate in the university, the expression of radicalism is confined to a minority of the student body as well as to some "official radicals" among the faculty members, which is tolerated on behalf of the system's necessary flexibility. However, the more the sociopolitical rule of society relies on coercion rather than on consensus, the more universities become centers of challenge to the political system, as it is often the case, for instance, in Latin America (Nassif, Rama, and Tedesco 1984). In such cases universities are still predominately ideological apparatuses, although they work for social change rather than for social conservatism.

Second, universities have always been mechanisms of selection of dominant elites, including the socialization of these elites, the formation of networks for their cohesion, and the establishment of distinctions between these elites and the rest of the society. The classic liberal arts college in the Anglo-Saxon tradition, including the Oxbridge version of theological schools or the state-based European universities, played a fundamental role in the formation of the new elites of the protoindustrial and industrial societies as family heritage was eroded in its legitimacy as the sole source of social power. Without substituting for the ideological role of universities (and actually frequently overlapping with it), selecting elites and forming social networks became the backbone of the leading institutions of the university system. The English system, built around the undisputed dominance of Oxford and Cambridge, is probably the quintessence of this elitist role of university. However, the role played by the Ivy League universities in the United States, by the University of Louvain based on the influence of the Catholic Church in Belgium, or by the University of Moscow in the former Soviet Union is very similar, and reproduces the process of elite selection and formation while adapting it to the historical and cultural characteristics of each society.

The elite selection function should not be necessarily associated with private universities oriented toward the aristocratic or bourgeois elites. For instance, in France, where serving the state was traditionally the most noble function that carried with it the highest power and prestige, the elite university is fully institutionalized in the system of the Grandes Ecoles, loosely connected to the university system, but largely independent from it. The Grandes Ecoles prepare students exclusively for the civil service, and graduates commit themselves to at least ten years of service to the state. At the top of the technical Grandes Ecoles, the Ecole Polytechnique is technically linked to the French army, and although the great majority of its graduates have probably never touched a gun, they keep climbing in the hierarchy of Army officers as their "active duty" generally takes place in the technocracy of the French state. As a sign of the state's dominance over private firms in France, the elite of industrialists (but also of leading managers) is often recruited among former graduates of the Grandes Ecoles after they have accomplished their "tour of duty" in government. Thus, elite-oriented universities are linked to the specific history and composition of elite formation in each country.

The science-oriented university actually came very late in history despite the practice of science in universities at all times, including the achievement of fundamental scientific discoveries in universities that were by and large ideological apparatuses. The first universities focusing on science and research as a fundamental task were the leading German universities in the second half of the nineteenth century, although there were a few early transfers of the science university model to the United States, particularly the Johns Hopkins University, built around the medical school.

Third, what seems today to be the most obvious function of the university, that is, the generation of new knowledge, is actually the exception throughout the world. In many countries

it was not fully recognized as a fundamental task by the political institutions and private firms until the coming of the current technological revolution, when the examples of the decisive influence of U.S. science-oriented universities in the new processes of economic growth (the "Silicon Valley syndrome") became apparent. However, despite this shift in the concept of the universities' role, in most of Europe research has been institutionally separated from higher education and confined to national scientific research centers of the French, Spanish, or Italian type, while the German model (still operating on the principle of separation between teaching and research) has been somewhat more flexible in the interaction between the two functions. While many European governments have not trusted the universities with scientific research, viewing them as too vulnerable to pressure from students, in other areas of the world, particularly Japan, until recently private firms have also distrusted universities as research-oriented organizations, leaving research as an in-house activity, supported by government funds, and directly linked to the needs and orientations of large private firms.

The popularity of the research-oriented university arose from the model's success in the U.S. university system. Here both private universities modeled after pioneering engineering schools such as Massachusetts Institute of Technology (MIT), Stanford, or Cal Tech, and public universities endowed by the land grants policies, particularly in the Mid-West and California, played a fundamental role in generating new knowledge and using it to usher in a new era of industrialization based on new technologies (Veysey 1965). However, while this model is now imitated throughout the world, it is specific to the United States (despite its German origins), and remains the exception among universities even in the United States, where only about 200 of the 3,500 universities and colleges can be considered as knowledge producers.

While the U.S. science university received a major boost from the government's military needs during World War 2 and the Cold War, the science university model became fully developed only as an expansion of the role of another model, the professional university. This is the university focused on a fourth function, perhaps nowadays the largest and most important, the training of the bureaucracy. This has been a basic university function since universities were church schools specializing in the formation of church bureaucrats, and it was certainly the focus of the Napoleonic model of the university that inspired most European universities. Similarly, the traditional Chinese university system was structured around preparing students for the imperial system of examinations for the state bureaucracy, a model that inspired the Japanese and Korean systems. Thus, much of the university system is rooted in a statist tradition.

However, when the process of industrialization required training large numbers of engineers, accountants, economists, social workers, and other professions, and when the expansion of the health and education systems demanded millions of teaching staff and medical personnel, universities were called upon to provide both general and specialized training for this massive skilled labor force. At the same time, they had to equip themselves to accomplish this function, thus becoming large consumers of their own production. The professional university that focused on training the labor force was particularly successful in those countries where it became close enough to the industrial world to be useful to the economy, but not so close that it lost its specific role vis à vis the short-term interests of particular segments of the industry. Thus, the land grant universities in the United States created by state governments to develop regional economies were the experience that opened the way for other professional universities. The agricultural schools of California and Wisconsin and the engineering schools of Michigan and Illinois generated a culture of close interaction between the university and the business world, leading to an expansion of the role of these universities in science, technology, and the humanities, but always closely linked to their original developmental tasks. The U.S. university experience is better represented by the professional model epitomized by MIT or Wisconsin than by elite universities such as Yale or Stanford, which are regional varieties of the university as selector of social elites. The science-oriented university came later, and developed both on the basis of the elite university and of the professional university.

Thus, in the United States the professional university gave birth to the science university as the economy's needs made research as a strategic tool to enhance productivity and

competitiveness increasingly important. Universities' ability to generate research while disseminating it into the industrial world was critical for the university to keep its training function together with its scientific function (Wolfle 1972).

By contrast, those universities that became completely subordinate to the needs of the labor market in the context of a planned economy, as in the socialist countries, were unable to perform their training function, much less their research function (Peper 1984). This was because in a world where technology is changing rapidly, the critical training for engineers and technicians is teaching them to adapt constantly to new technologies.

While these four functions (generation and transmission of ideology, selection and formation of dominant elites, production and application of knowledge, and training of the skilled labor force) represent the main tasks performed by universities, with the emphasis shifting among countries, historical periods, and specific institutions, universities as organizations are also submitted to societal pressures. In many societies, especially in the West, the demand for higher education has reached the status of a social need regardless of the economy's actual functional requirements. This expression of the aspiration of all societies to upgrade their education has led to the so-called "massification of the University system" as the institutions respond to excess demand by downgrading some elements of the system and transforming them into reservoirs of idle labor, a particularly useful function if we consider that this idle labor is composed of potentially restive youth. Thus, an implicit function of modern university systems is to absorb surplus labor, particularly from the lower-middle classes who think their children are entitled to social mobility through the university system.

The critical element in the structure and dynamics of university systems is their ability to combine and make compatible seemingly contradictory functions. The fact that because universities are social systems and historically produced institutions, all their functions take place simultaneously within the same structure, although with different emphases is probably the most complex analytical element to convey to policymakers. There is such thing as a pure, or quasi-pure, university model.

Indeed, once the developmental potential of universities has been generally acknowledged, many countries try to build "technology institutes," "research universities," and "university-industry partnerships." Thus, after centuries of using universities mainly as ideological apparatuses and/or elite selection devices, policymakers and private firms have turned toward the university as a productive force in the informational economy. However, universities will always be open to the debates of society, and thus to the generation and confrontation of ideologies. The technocratic vision of a purely scientific or purely professional university is just that, a historical vision sentenced to constant betrayal by historical reality, as the experience of the rather good quality Korean universities, never tamed by the government despite its political control, clearly shows. The real issue is not so much to shift universities from the public arena to secluded laboratories or capitalist board meetings, as to create institutions solid and dynamic enough to withstand the tensions that will trigger the simultaneous performance of somewhat contradictory functions. The ability to manage such contradictions while emphasizing universities' role in generating knowledge and training labor in the context of the new requirements of the development process will to a large extent determine the capacity of countries and regions to become part of the new world economy.

Universities in the Developing World: From Dependency to Development

To assess the role and tasks of universities in developing countries in the development process we must first consider their specificity against the background of the analytical framework presented in this chapter. With the exception of China and Thailand, the specificity of the university system in the developing world is that it is historically rooted in its colonial past. This maximizes the universities' role as ideological apparatuses as well as their reaction against cultural colonialism, but still emphasizes their ideological dimension in the initial post-independence period.

In the case of the British colonies, the report of the Asquith Commission, published in 1945, set up the conditions for the organization of universities in the British colonies around the model of the British civic university. In the case of the French colonies in Africa, a 1944 meeting held in Brazzaville by the French provisional government saw the universities as an extension of the French university system, and organized them to prepare the best students to follow their training in the metropolis (Sherman 1990). An even more clear expression of direct cultural imposition is the case of Zaire, where the Louvanium University Center in the Congo was an extension of the Catholic University of Louvain. Even modern universities such as the University of Hong Kong appear to visiting faculty members as pure British exports that retain all the imperial flavor of Kipling's writings.

As for Latin America, the much earlier independence of Latin American countries makes the origins of universities less directly relevant to their current role. However, the statist-religious character of the colonial foundations of the university system still permeates the structure and ideology of contemporary colleges, emphasizing ideology and social status over economic and labor training functions (Solari 1988).

The recruitment of social elites, first for the colonial administration, later for the new political elites created with independence, became the fundamental function of universities in the developing countries. Because many political regimes were unstable for a long time, for two centuries in Latin America and during the second half of this century in Asia and Africa universities became a mix of conflicting political elites all competing to lead and shape the nationalist ideology of cultural self-determination and political autonomy. Thus, in many countries the universities' political function (what in Latin America is known as the "militant university"), which combined their ideological function and the formation of new social elites, has been predominant, to the detriment of the educational and economic tasks that they could have performed. As several university leaders have proclaimed, the political preconditions had first to be set up for universities to be able to proceed with their specific roles. In many cases this has led to problems for faculty members. The contradictions between academic freedom and political militancy and between the drive for modernization and the preservation of cultural identity have been a fundamental cause of the loss of the best academic talent in most developing countries.

Nevertheless, when countries had to face development tasks in a modern, increasingly integrated world economy during the last thirty years, the need to train skilled labor gave a new impetus to universities as educational institutions. Furthermore, the extension of the traditionally important middle class in Latin America and the formation of a new professional class in Asia and Africa that gave priority to educating their children at the highest possible level led to an enormous expansion of university enrollment. The new nationalist governments have actually used the creation of universities and the increase in the number of students as a measure of their development efforts. However, much of this increase has taken place in traditional areas of education (law, humanities, social sciences), as the main task of the university system continued to be to recruit and train the administrative and managerial classes on which the political system relied. In addition, in the most socially-oriented regimes, careers in the social services, particularly education and health, became increasingly important. Indeed, educational workers (mainly school teachers) have become one of the most important occupational groups in the lower-middle classes of developing countries.

A number of countries have also tried to increase the level of training in the scientific and technical professions, particularly in engineering and agriculture-related degrees. However, such efforts have faced three major obstacles:

- The lack of sufficient faculty trained to use the most recent technology;
- The lack of funding to train students in experimental sciences and professional schools, leading to a teaching program dominated by verbal communication and too many students, thereby lowering the quality of the technical training;

- **The vicious circle whereby developing countries have few jobs for highly skilled engineers and scientists because few firms can operate in these countries at a high technological level because of the lack of skilled manpower.**

The net result is that much of the increase in university recruitment goes to careers without a direct impact on the development process because they are less expensive and the failures in the training are less visible. There is, of course, the possibility of breaking up the vicious circle by a deliberate policy of investment in technical higher education. Economies that have implemented such a policy have received substantial payoffs, for example, China, the Republic of Korea, Taiwan (China), and to a lesser extent Malaysia and Singapore The policy involves recruiting foreign faculty and/or attracting highly trained nationals back to their home country. In the last decade a number of developing countries have created technology institutes to emphasize the need to train skilled engineers, scientists, and technicians. However, only some of these institutes live up to the expectations generated by their flashy names and their brand new buildings: those investing enough resources in good faculty and modern equipment. Thus, only relatively rich countries can provide the necessary resources to upgrade their labor force, creating a new gap within the developing world.

While the training function of developing country universities is slowly making progress, the science function is increasingly lagging in relationship to the acceleration of scientific research in the industrial countries, particularly in R&D in new technologies. This is due both to structural reasons and institutional causes.

The structural reasons have to do with the cumulative character of uneven scientific development. Centers of excellence that take the lead attract the best researchers, who obtain the best equipment and material conditions, and are able to attract the best students, who end up forming a closely connected network. Thus, most of the best developing country scientists migrate to the United States or Europe or stay there on completing their doctorates because this is the only way for them to continue to do research in the cutting edge of their specialty. Salary and working conditions appear secondary to the basic condition: to belong to an advanced scientific milieu.

The institutional conditions are linked to the specificity of developing country universities that make their performance as centers of generation of knowledge difficult. The need to preserve a cultural identity and the tensions created by the extreme politicization of universities in overcrowded conditions make managing the coexistence of ideological and political functions with the university's scientific activity extremely difficult. The necessary distance and independence of academic research become impossible when students and some faculty are engaged in changing the world or in affirming themselves as their main goal. In addition, the existence of large segments of the university population that are simply treated as surplus labor makes it difficult to maintain respect for scientific activity on the part of students and faculty that are relatively marginal to society or of administrators whose main concern is to keep the system operating regardless of its actual output in terms of the generation and transmission of knowledge.

The inability to manage contradictory function within the same system has led a number of countries to concentrate their efforts on a few technical universities while neglecting much of the existing university system. This can be a short-term solution for training some technical personnel in certain specialties, but will not meet the needs of the scientific university. One of the key elements in developing universities as centers of discovery and innovation is the cross-fertilization between different disciplines (including the humanities), together with their detachment from the economy's immediate needs. If the scientific community cannot choose which goals of scientific research to pursue, there will be no discovery. Of course there must be links between science, technology, and industrial applications, but it is only possible to apply that science that exists. Thus, locating the productive functions of the university system in a few technical schools can only be a temporary measure to rebuild a complete higher education system based on additional resources, better management, and adequate connections with the world's scientific centers.

Developing country universities are making dramatic progress in quantitative terms, but are still by and large unable to perform their developmental function. Even university systems excelling in science, such as the Indian and Chinese university systems, are falling behind those systems that have been able to manage the interaction between science, technology, the economy, and society. The ideological and political origins of most developing country universities cannot be ignored, but should not be permitted to suffocate the universities' evolution toward their central role in modernization and development. If developing countries are also to enter the information age, development policies must include the transformation of higher education systems.

Higher Education as Development Policy

If the substantial enhancement of university systems is critical for the development process in the new world economy, and if most countries are unable to mobilize the necessary resources, it follows that the new frontier of international aid passes through the territory of higher education. However, the effectiveness of such aid will depend on the ability to design policies that take the specificity of universities as institutions into account and can, at the same time, link their science and training functions with the needs and goals of the economy and society.

In most countries university systems overwhelmed by numbers and handicapped by a lack of resources and excessive ideologization cannot be completely restructured in the short term. This implies selective aid, either concentrating resources in the best of the existing academic centers or/and creating new universities supported by national governments, private firms, and international institutions. Yet, in both cases universities must be conceived of as complete academic centers of learning and research, with all levels of training (undergraduate and graduate) and with as many areas of study as possible (science, technology, humanities, social sciences, and professional schools). The cross-fertilization between different areas of specialization, with flexible programs that emphasize students' capacity to think, locate information, and be able to undergo retraining in the future, seems to be the most effective pedagogic formula according to most education experts. At the same time, the coexistence of different levels of training permits interaction between advanced students dedicating themselves to research and teaching and professionally-oriented students.

The new developing country universities must also emphasize research, both basic and applied, as this will become the means for upgrading the country's productive system. Research must be connected both to the world's scientific networks and to the country's specific needs and productive structure. This probably requires the existence of specialized organizations that must be part of the university system, for example, information centers, international exchange programs, bureaus of technology transfer, bureaus of industrial or agricultural extension, and university-enterprise networks.

Institutional reforms of universities or the creation of new universities should be undertaken under cooperative agreements between international institutions (such as the United Nations or the World Bank) and national governments, with the support and participation of private firms interested in upgrading national or regional technological capabilities. They should simultaneously foster institutional innovation and provide the resources for upgrading the system. Foremost among the needed resources is the human capital represented by top quality faculty and researchers. While in the long term the new developing country universities should be able to compete for resources on the open world market and generate their own high quality academic personnel, in the coming years universities will have to improve their quality using a combination of several policies:

- Training or retraining young faculty and doctoral students in centers of excellence in industrial countries after providing them with the scientific and professional incentives to return to their home countries after the training.
- Recruiting nationals of developing countries established at the universities of advanced societies by offering them equal or better working conditions. Aid programs should target

specific individuals and provide the necessary support for endowed chairs and research centers in priority areas.

- Using visiting foreign faculty temporarily in strategic fields of research conducive to the formation of a research group in the developing country university, and to the continuation of the linkage between the newly established group and the visiting faculty once they return to their home country.
- Using talent available in private firms and the public sector of developing countries as adjunct professors to provide their experience and knowledge to a university world that they previously tended to ignore because of the university system's low social and economic status.
- Establishing joint research centers and training programs between technologically advanced private firms (either national or multinational) and national universities, supported by international organizations. These mutually beneficial agreements, of which numerous examples already exist, should be integrated in a broader program of institution building instead of being kept, as is generally the case, under the close control of the participant corporation.

Once the two basic elements of a good university are established, that is, a proper institutional setting and high quality faculty, material resources in terms of equipment and physical plant can be provided without being wasted. Only after such an infrastructure exists can the recruitment of students begin and the necessary funds for fellowships and tuition facilitated.

Obviously such a program of multilateral investment in higher education is expensive and will only yield substantial results in the medium term, no sooner than ten years, but this is true for most development programs investing in infrastructure. The key is to understand that the most important infrastructure in the economy of our age is the human brain and the collective capacity of a given society to link up its brains with the world's brains.

Given the expense involved and the permanent limits set by scarce resources, the program will have to concentrate on centers of higher education that act as models for other systems. Some countries are large enough to receive direct aid to their national institutions (Brazil, China, India, Indonesia, Mexico, Nigeria). In other instances, the best course will probably be to build regional universities (for example, the University of Central America, the South East Asian Institute of Technology, the West African International University) that will concentrate financial, technological, and human resources in a few centers of excellence. However, the experience of several international university centers shows the need to anchor international universities in the region's national universities instead of bypassing them else they create a pool of graduates that generally spread themselves among the international networks or become marginal in their own countries upon their return. A possible solution to the problems I have mentioned could be that high quality faculty members of national universities are required to spend a limited time (five years for instance) in joint centers or regional universities formed by the universities of the countries in the region. Thus, the joint center could become an element of integration and cross-fertilization between the various national universities, selecting the best students, who are taught by faculty of the national universities on a rotating basis.

In any case, specific organizational forms can be found if the basic principle is assumed: that it is necessary to concentrate international and national resources in a few centers, either in large countries or in regional groupings of countries, that will operate in direct connection with the development needs of their societies and economies. International aid (both public and private) should be channeled through these institutions.

While agreeing on the importance of improving higher education for the development of the developing countries is relatively easy, the question arises of who would be interested in supporting such a major undertaking and why countries or firms would be ready to assume the substantial economic cost and political effort required.

Conclusions

Based on the end of the Cold War, the demise of the communist threat, the development that is well underway in most of Asia, and the fruits of the current technological revolution, the coming century appears promising. We seem indeed to be on the edge, not of the end but of the beginning, of history if by history we understand the opportunity for the human species to fully develop its biological and cultural capacities. Yet at the same time our social organization has substantial pitfalls if we consider the extent of economic inequality and political oppression at the world level and the lack of harmony between economic growth and ecological conservation. As most of these evils take root in the poverty and underdevelopment prevailing in large areas of the developing world, the construction of a more stable, more promising international order in the aftermath of the Cold War would appear to require the multilateral tackling of the development process on a planetary basis. Advanced countries and their private firms cannot thrive in a shrunken world, concentrating their technology and resources on a diminishing segment of humankind, for several fundamental reasons:

- Morally, our children will judge our model of society by its capacity to look beyond the immediate self-interest of each of its individual members.
- Functionally, the growing deterioration of natural resources and collective public health, directly linked to poverty and mass desperation, will affect the whole of humanity. The Peruvian cholera epidemic is only the beginning of what could be the return to medieval plagues if living conditions are not improved in the poorest countries' sprawling shanties.
- Politically, widespread misery and functional marginality for countries and regions in the midst of a world marked by economic affluence and technology miracles transmitted by the electronic media will feed ideological fundamentalism, fanaticism, and terrorism.
- Economically, the potential gap between the fast rate of technological innovation and the slower growth of markets can only be solved in the long term by including new markets in the world economy, namely, new people with new needs to be satisfied. Today's aid should be viewed as an investment for tomorrow. It is in the economic self-interests of the OECD countries and their corporations.

If we take seriously the analyses pointing toward the formation of a new economy, in which the ability to generate and process information is key to productivity, it will not be possible to integrate developing countries in a dynamic world economy without creating the necessary infrastructure in higher education. Because research and education policies take time to bear fruit, such policies must be placed at the forefront of international aid.

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